NEW NORTH AMERICAN SPECIES OF ARRENURUS, MOSTLY FROM FLORIDA (ACARINA: ARRENURIDAE)[1]

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INTRODUCTION

Arrenurus is the largest of the North American water mite genera as far as number of species is concerned. Over one hundred species have already been described from this area. Two other workers have studies on *Arrenurus* completed or nearly completed. Dr. Willard C. Young (personal communication) is describing a number of very interesting new species from southcentral Texas and Dr. Gary R. Mullen (personal communication) is reviewing the North American members of the subgenus *Truncaturus*. With the publication of the material listed above and this work, the number of known Nearctic species will stand at approximately 150. Those persons interested in a historical review of the work done on this group in North America should consult Wilson (1961). This same publication contains a bibliography covering most of the systematic papers on the Nearctic species. One additional species, *A. kennedyorum* was described by Habeeb (1963) from New Mexico. Mitchell (1954) provides a check list and reference source for the species described before the middle of 1954.

One serious deficiency in our knowledge of Nearctic arrenuri is the small number of females known or at least described in sufficient detail to permit recognition. This is not surprising for it is the males, with their often bizarre modifications of the posterior end of the body, which best show species differences. Females of a species group may be very similar and, especially in localities with a large number of species, it is very difficult to associate males and females with certainty. I am describing the females of 14 of the new species. This association of the two sexes was made possible either because the specimens were part of a very restricted fauna, or because the species exhibited a very unusual modification of the palp or anterior end of the body. However, for the majority of these new species (and most North American species in general) it may be necessary to utilize rearing methods, rather than relying on field collected material, before the females are identified with certainty.

Palpal and leg segment lengths are given only for the holotype and allotype individuals. However, when possible, body measurements are presented for a series of specimens. Measurements from the holotype and allotype are given first. If a number of specimens are available for that species, the range of size variation of the paratype series is given in parentheses following the measurements of the primary types. Holotypes and allotypes will be deposited in the Field Museum of Natural History (Chicago). Lora J. Burton typed the manuscript for photolithoprinting.

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SPECIES DESCRIPTIONS

1. *Arrenurus* (*Arrenurus*) *arguticornis*, new species

(Figures 1, 3, 4)

Male: Body, including petiole, 1520μ in length, 1003μ in width; pygal lobes of moderate length and directed more or less laterally; width between outer margins of pygal lobes 684μ; dorsal shield 623μ in width; dorsal furrow passing onto sides of body at base of pygal lobes; non-cauda portion of dorsal shield bearing two pairs of glandularia, second pair located on well developed humps; humps of dorsal shield pointed and directed slightly forward when viewed laterally (fig. 3) and noticeably depressed in the area between the humps; anterior end of body projecting and noticeably concave between the eyes; lateral humps on dorsal portion of ventral shield high (fig. 3); petiole approximately 275μ in length, 231μ in width; petiole widest posteriorly; proportions of petiole better illustrated than described; hyaline appendage very long and decidedly concave posteriorly; acetabular plates extending up sides of body well beyond the associated glandularia; dorsal lengths of the palpal segments: P-I, 50μ; P-II, 120μ; P-III, 100μ; P-IV, 133μ; P-V, 70μ; figure 4 shows the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 418μ; IV-Leg-5, 236μ; IV-Leg-6, 258μ; distal end of IV-Leg-4 extending well beyond insertion of the fifth segment; distal end of IV-Leg-4 slightly recurved; third and fourth legs with well developed swimming hairs; sixth segments of first and second legs with many, short "swimming hairs".

Female: Unknown

Holotype: Adult ♂, collected in a lake in Ocala National Forest (on Highway 40 one mile east of junction with Highway 19), Lake County, Florida, November 19, 1970.

Discussion: This distinctive species does not seem closely related to any previously described species.

2. *Arrenurus* (*Arrenurus*) *manateensis*, new species

(Figures 2, 5, 6)

Male: Body, including petiole, 1109μ (1079μ-1109μ) in length, 729μ (729μ-753μ) in width; pygal lobes of moderate length and directed more or less posteriorly; width between outer margins of pygal lobes 479μ (471μ-485μ); dorsal shield 425μ (425μ-441μ) in width; dorsal furrow passing onto sides of body at base of pygal lobes; dorsal shield bearing two pairs of glandularia on non-cauda portion; second pair of these glandularia located on well developed humps; humps of dorsal sheild blunt when viewed laterally (fig. 5) and only slightly depressed in the area between the humps; anterior end of body somewhat projecting and only slightly concave between the eyes; lateral humps on dorsal portion of ventral shield relatively low (fig. 5); petiole approximately 145μ in length, 103μ (96μ-103μ) in width; petiole widest distally; basal piece of petiole open dorsally and decidedly downturned at tip when viewed laterally (fig. 5); central piece of petiole greatly widened posteriorly; proportions of petiole illustrated in figures 2 and 5; hyaline appendage only moderately developed; acetabular plates extending up sides of body slightly beyond the associated glandularia; dorsal lengths of the palpal segments: P-I, 33μ; P-II, 78μ; P-III, 66μ; P-IV, 100μ; P-V, 53μ; figure 6 illustrates the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 388μ; IV-Leg-5, 145μ; IV-Leg-6, 182μ; distal end of IV-Leg-4 extending well beyond insertion of IV-Leg-5; third and fourth legs with well developed swimming hairs; sixth segments of first and second legs with a series of short "swimming hairs".

Female: Unknown.

Holotype: Adult ♂, collected in a small pond at the side of Highway 37 (slightly south of the Hillsborough County line), Manatee County, Florida, November 12, 1970.

Paratypes: 3 ♂♂, same data as holotype; 1 ♂, collected in a cypress pond in Pasco County, Florida, April 9, 1950.

Discussion: The new species belongs to the *americanus*-group, but differs in characters best seen in lateral view. The petiole of *manateensis* is comparatively much longer and narrower than in any other member of the group and the pronounced downward turning of the basal piece (fig. 5) is unique.

3. Arrenurus (Arrenurus) newelli, new species

(Figures 7, 8, 11)

Male: Body, including petiole, 1048μ (1048μ-1109μ) in length, 714μ (714μ-775μ) in width; pygal lobes relatively long and directed more or less posteriorly; width between outer margins of pygal lobes 509μ (509μ-532μ); dorsal shield 448μ (441μ-460μ) in width; dorsal furrow passing onto sides of body at base of pygal lobes; non-cauda portion of dorsal shield bearing two pairs of glandularia, second pair located on well developed humps; humps of dorsal shield blunt when viewed laterally (fig. 7) and only slightly depressed in the area between the humps; anterior end of body somewhat projecting and only slightly concave between the eyes; lateral humps on dorsal portion of ventral shield relatively high; petiole approximately 135μ in length, 103μ (93μ-103μ) in width; petiole gradually widening posteriorly; basal piece of petiole open dorsally; central piece greatly widened posteriorly; petiole proportionally very stocky when viewed laterally (fig. 7); hyaline appendage only moderately developed; acetabular plates extending up sides of body well beyond the associated glandularia; dorsal lengths of the palpal segments: P-I, 37μ; P-II, 85μ; P-III, 65μ; P-IV, 94μ; P-V, 55μ; figure 8 illustrates the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 434μ; IV-Leg-5, 167μ; IV-Leg-6, 197μ; distal end of IV-Leg-4 extending well beyond insertion of the fifth segment and decidedly recurved at tip; only the fourth leg bears well developed swimming hairs.

Female: Unknown.

Holotype: Adult ♂, taken in a pond beside Highway US 90 two miles east of Ponce de Leon, Holmes County, Florida, November 8, 1970.

Paratypes: 3 ♂♂, same data as holotype; 2 ♂♂, from a pond on Highway 79 (near junction with Route 280), Washington County, Florida, November 9, 1970.

Discussion: The structure of the petiole and the blunt humps of the dorsal shield place the new species in the *americanus*-group and it is probably most closely related to *A. major* Marshall. It differs most noticeably from the latter in its very high lateral humps on the dorsal portion of the ventral shield and its very stocky petiole when viewed laterally (fig. 7).

4. *Arrenurus* (*Arrenurus*) *marionensis*, new species

(Figures 9, 10, 12)

Male: Body, including petiole, 1368μ (1292μ-1383μ) in length, 973μ (927μ-974μ) in width; pygal lobes of moderate length and directed posterolaterally; width between outer edges of pygal lobes 577μ (562μ-578μ); dorsal shield 577μ (546μ-577μ) in width; dorsal furrow passing onto sides of body at base of pygal lobes; non-cauda portion of dorsal shield bearing two pairs of glandularia, second pair located on well developed humps; humps of dorsal shield pointed when viewed laterally (fig. 9) and noticeably depressed in the area between the humps; anterior end of body projecting and decidedly concave between the eyes; lateral humps on dorsal portion of ventral shield relatively high (fig. 9); petiole approximately 210μ in length, 182μ (178μ-186μ) in width; basal piece of petiole open dorsally and greatly expanded posteriorly; central piece of petiole greatly widened posteriorly and mucronate at tip; proportions of petiole better illustrated (figs. 9, 12) than described; hyaline appendage only moderately developed; acetabular plates extending up sides of body well beyond the associated glandularia; dorsal lengths of the palpal segments: P-I, 46μ; P-II, 115μ; P-III, 88μ; P-IV, 133μ; P-V, 77μ; figure 10 shows the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 386μ; IV-Leg-5, 197μ; IV-Leg-6, 258μ; third and fourth legs with well developed swimming hairs, those of the first and second segments relatively short and mostly confined to the sixth segments.

Female: Unknown.

Holotype: Adult ♂, collected in a pond beside Highway US 90 two miles east of Ponce de Leon, Holmes County, Florida, November 8, 1970.

Paratypes: 5 ♂♂, taken in a lake near Mill Dam in Ocala National Forest, Marion County, Florida, November 19, 1970.

Discussion: The new species seems to belong in the *falcicornis*-group although the glandularia tubercles or humps of the dorsal shield do not point anteriorly as is typical of the group (compare figures 9, 13). *A. marionensis* also differs in its posteriorly expanded basal piece of the petiole and the large, angular, mucronate central piece (fig. 12).

5. *Arrenurus* (*Arrenurus*) *apopkensus*, new species

(Figures 13, 14, 16)

Male: Body, including petiole, 1034μ (1034μ-1095μ) in length, 744μ (744μ-765μ) in width; pygal lobes of moderate length and directed more or less posterolaterally; width between outer margins of pygal lobes 517μ (517μ-532μ); dorsal shield 441μ (441μ-471μ) in width; non-cauda portion of dorsal shield bearing two pairs of glandularia, second pair located on well developed humps; humps of dorsal shield pointed and directed anteriorly when viewed laterally (fig. 13) and decidedly depressed in the area between the humps; anterior end of body slightly projecting and slightly concave between the eyes; lateral humps on dorsal portion of ventral shield relatively low (fig. 13); petiole approximately 152μ in length, 111μ in width; petiole widest posteriorly; basal piece of petiole open dorsally and with small ventrolaterally directed hyaline extensions; central piece of petiole greatly widened posteriorly and more or less truncate; proportions of petiole better illustrated (figs. 13, 16) than described; hyaline appendage well developed and only slightly concave posteriorly; acetabular plates extending up sides of body well beyond the associated glandularia; dorsal lengths of the palpal segments: P-I, 33μ; P-II, 90μ; P-III, 88μ; P-IV, 111μ; P-V, 66μ; figure 14 illustrates the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 342μ; IV-Leg-5, 160μ; IV-Leg-6, 221μ; distal end of IV-Leg-4 extending well beyond insertion of IV-Leg-5; fourth leg with well developed swimming hairs; sixth segments of first and second legs with a series of short "swimming hairs".

Female: Unknown.

Holotype: Adult ♂, taken in Lake Tsala Apopka on Highway 44 east of Inverness, Citrus County, Florida, November 11, 1970.

Paratype: 1 ♂, taken in a water filled ditch in Collier County, Florida, April 13, 1950.

Discussion: The structure of the petiole and dorsal humps places the present species in the *falcicornis*-group. The morphology of the petiole is most like that of *A. pistillatus* Marshall (California). The new species differs in being larger and in possessing a truncate posterior end on the central piece of the petiole.

6. Arrenurus (Arrenurus) zeugicornis, new species

(Figures 15, 17, 18)

Male: Body, including petiole, 1109μ (1109μ-1231μ) in length, 775μ (775μ-866μ) in width; pygal lobes of moderate length, directed more or less posterolaterally and bearing a small hump (fig. 15); width between outer margins of pygal lobes 547μ (539μ-577μ); dorsal shield 456μ (456μ-502μ) in width; dorsal furrow passing onto sides of body at base of pygal lobes; non-cauda portion of dorsal shield bearing two pairs of glandularia, second pair located on well developed humps; humps of dorsal shield pointed and directed somewhat anteriorly when viewed laterally (fig. 17) and noticeably depressed in the area between the humps; anterior end of body slightly projecting and slightly concave between the eyes; lateral humps on dorsal portion of ventral shield relatively low (fig. 17); petiole approximately 140μ in length, 92μ (82μ-96μ) in width; petiole only slightly widened posteriorly; basal piece of petiole open dorsally and lacking the ventrolaterally directed hyaline extensions found in the preceding species; central piece of petiole greatly widened posteriorly and rounded at the posterior end; proportions of petiole better illustrated (figs. 15, 17) than described; hyaline appendage short and somewhat concave posteriorly; acetabular plates extending up sides of body slightly beyond the associated glandularia; dorsal lengths of the palpal segments: P-I, 33μ; P-II, 89μ; P-III, 76μ; P-IV, 86μ; P-V, 55μ; figure 18 illustrates the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 358μ; IV-Leg-5, 141μ; IV-Leg-6, 197μ; distal end of IV-Leg-4 extending nearly to distal end of IV-Leg-5; third and fourth legs with swimming hairs; sixth segments of first and second legs with many short "swimming hairs".

Female: Unknown.

Holotype: Adult ♂, collected in a lily pond beside Highway 72, about 3.5 miles west of entrance to Myakka River State Park, Sarasota County, Florida, November 13, 1970.

Paratypes: 1 ♂, from a pond near Lake Maggiore, Pinellas County, Florida, April 10, 1950; 5 ♂♂, taken in the canal at the junction of Highways US 41 and Fla. 27, Dade County, Florida, April 14, 1950.

Discussion: The morphology of the dorsal humps and petiole shows the affinities of the present species are with the *falcicornis*-group, and it seems most closely related to *pistillatus* Marshall and the preceding species. *A. zeugicornis* differs from both in having a narrower petiole and lacking the ventrolaterally directed hyaline extensions on the basal piece. The pygal lobes are also more angular in the new species.

7. Arrenurus (Arrenurus) tamiamiensis, new species

(Figures 19, 21, 22)

Male: Body, including petiole, 1003μ (958μ-1034μ) in length, 707μ (684μ-770μ) in width; pygal lobes of moderate length and directed more or less posterolaterally; width between outer margins of pygal lobes 471μ (456μ-509μ); dorsal shield 410μ (410μ-434μ) in width; dorsal furrow passing onto sides of body at base of pygal lobes; dorsal shield bearing two pairs of glandularia in non-cauda portion, second pair of these glandularia located on well developed humps; humps of dorsal shield pointed and directed anteriorly when viewed laterally (fig. 21) and decidedly depressed in the area between the humps; anterior end of body slightly concave between the eyes; lateral humps on dorsal portion of ventral shield relatively low (fig. 21); petiole approximately 133μ in length; petiole widest posteriorly; basal piece of petiole open dorsally and with pronounced ventrolaterally directed hyaline extensions; width of basal piece (excluding hyaline extensions) 104μ (104μ-115μ), width of basal piece including hyaline extensions 163μ (148μ-170μ); central piece of petiole widened posteriorly, then narrowing to a point (central piece of some specimens wider than that illustrated); hyaline appendage long and very concave posteriorly (fig. 19); acetabular plates extending up sides of body well beyond associated glandularia; dorsal lengths of the palpal segments: P-I, 37μ; P-II, 87μ; P-III, 70μ; P-IV, 94μ; P-V, 53μ; figure 22 shows the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal extension), 296μ; IV-Leg-5, 148μ; IV-Leg-6, 192μ; fourth leg with well developed swimming hairs; sixth segments of first and second legs with several short "swimming hairs".

Female: Unknown.

Holotype: Adult ♂, collected in the Tamiami Canal near the Collier County line, Dade County, Florida, November 14, 1970.

Paratypes: 2 ♂♂, same data as holotype; 8 ♂♂, taken in the canal at the junction of Highways US 41 and Fla. 27, Dade County, Florida, April 14, 1950.

Discussion: The structure of the petiole and dorsal humps indicates the affinities of the present species are with the *falcicornis*-group. However, the widely extending ventrolateral projections on the basal piece of the petiole are diagnostic for *tamiamiensis*.

8. Arrenurus (Arrenurus) zapus, new species

(Figures 20, 23, 24)

Male: Body, including petiole, 1231μ (1231μ-1300μ) in length, 881μ (881μ-942μ) in width; pygal lobes well developed and directed posterolaterally; width between outer margins of pygal lobes 577μ (562μ-638μ); dorsal shield 532μ (532μ-548μ) in width; dorsal furrow passing onto sides of body at base of pygal lobes; dorsal shield bearing two pairs of glandularia in the non-cauda portion, second pair of these glandularia lying on well developed humps; humps of dorsal shield sharp-pointed and directed decidedly forward when viewed laterally (fig. 23) and noticeably depressed in the area between the humps; anterior end of body projecting and decidedly concave between the eyes; lateral humps on dorsal portion of ventral shield relatively high (fig. 23); petiole approximately 185μ in length, 140μ (133μ-140μ) in width; petiole widest posteriorly; basal piece of petiole open dorsally and with well developed ventrolateral extensions; central piece of petiole greatly widened posteriorly and notched at posterior end; proportions of petiole better illustrated (figs. 20, 23) than described; hyaline appendage moderately developed and only slightly concave posteriorly; acetabular plates extending up sides of body well beyond the associated glandularia; dorsal lengths of the palpal segments: P-I, 37μ; P-II, 104μ; P-III, 94μ; P-IV, 129μ; P-V, 66μ; figure 24 illustrates the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 410μ; IV-Leg-5, 175μ; IV-Leg-6, 228μ; distal end of IV-Leg-4 extending well beyond the insertion of IV-Leg-5; fourth leg with well developed swimming hairs; sixth segments of first, second and third legs with a series of short "swimming hairs".

Female: Unknown.

Holotype: Adult ♂, taken in the Tamiami Canal near the Collier County line, Dade County, Florida, November 14, 1970.

Paratypes: 2 ♂♂, collected in Upper Myakka Lake, Sarasota County, Florida, November 13, 1970; 4 ♂♂, from a lake near Mill Dam in Ocala National Forest, Marion County, Florida, November 19, 1970; 1 ♂, taken in Big Alligator Lake, Columbia County, Florida, April 9, 1950.

Discussion: The present species also belongs to the *falcicornis*-group. However, the combination of well developed ventrolateral projections on the basal piece of the petiole and extremely wide, posteriorly notched central piece (fig. 20) is diagnostic.

9. Arrenurus (Arrenurus) harperae, new species

(Figures 27, 28, 30-32)

Male: Body, including petiole, 1049μ (1041μ-1140μ) in length, 790μ (760μ-821μ) in width; pygal lobes short and directed more or less posterolaterally; width between outer margins of pygal lobes 562μ (528μ-562μ); dorsal shield 577μ (563μ-623μ) in width; dorsal furrow passing onto sides of body at base of pygal lobes; dorsal shield bearing two pairs of glandularia in non-cauda portion; dorsal shield with a single somewhat rounded median dorsal hump on which are located the more posterior pair of glandularia; posterior pair of glandularia very close together and with a pair of heavy setae between them (fig. 32); anterior end of body somewhat projecting but not concave between the eyes;

dorsal portion of ventral shield without laterally placed humps; petiole approximately 144μ in length, 88μ (87μ-89μ) in width; basal piece of petiole open dorsally and bearing a pair of setae posteriorly; central piece of petiole broadening posteriorly and more or less truncate at posterior end; structure and proportions of petiole better shown (figs. 27, 32) than described; hyaline appendage very short but wide; acetabular plates extending up sides of body but not as far as the associated glandularia; dorsal lengths of the palpal segments: P-I, 41μ; P-II, 94μ; P-III, 66μ; P-IV, 92μ; P-V, 52μ; figure 28 shows the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 340μ; IV-Leg-5, 141μ; IV-Leg-6, 200μ; distal end of IV-Leg-4 projecting somewhat beyond the insertion of the fifth segment; fourth leg with swimming hairs; sixth segments of first and second legs with many short "swimming hairs".

Female: Body 1109μ (1109μ-1231μ) in length, 973μ (973μ-1125μ) in width; anterior end somewhat projecting but not concave between the eyes; body oval and without humps; dorsal shield fused with the ventral shield posteriorly and bearing three pairs of glandularia; dorsal shield 729μ (729μ-806μ) in width; acetabular plate region 745μ (745μ-790μ) in width; gonopore 167μ (167μ-182μ) in width; figure 31 shows the structure and proportions of the venter; dorsal lengths of the palpal segments: P-I, 44μ; P-II, 92μ; P-III, 76μ; P-IV, 104μ; P-V, 53μ; structure of the palp similar to that illustrated for the male; dorsal lengths of the distal segments of the first leg: I-Leg-4, 163μ; I-Leg-5, 162μ; I-Leg-6, 155μ; fourth leg with swimming hairs.

Holotype: Adult ♂, taken from springs on the east side of the Rio Grande River one quarter mile south of bridge over river (on Highway 4 west of Pojoaque), Santa Fe County, New Mexico, October 17, 1970.

Allotype: Adult ♀, same data as holotype.

Paratypes: 7 ♂♂, 3 ♀♀, same data as holotype.

Discussion: The present species is closely related to *A. texensis* described by Young (1975) from a spring fed lake in Hays County, Texas. *A. harperae* differs in a number of characters, the most noticeable being its larger size, lack of lateral humps on the dorsal shield and not having the acetabular plates extending dorsally as far as the associated glandularia. The species is named for Kay Harper, who showed me the location of the isolated springs in which these specimens were taken.

10. Arrenurus (Arrenurus) arizonensis, new species

(Figures 25, 26, 29)

Male: Body, including petiole, 874μ in length, 634μ in width; pygal lobes very short but high (fig. 25) and directed more or less posteriorly; width between outer margins of pygal lobes 471μ; dorsal shield 486μ in width; dorsal furrow passing onto sides of body at base of pygal lobes; dorsal shield bearing two pairs of glandularia in non-cauda portion; both of these pairs of glandularia spaced far laterally; dorsal shield with a single, large hump which extends almost to the posterior end; a pair of very large glandularia located posteriorly (shown in figure 29 but best seen in posterior view); anterior end of body only slightly projecting and not concave between the eyes; dorsal portion of ventral shield without pronounced laterally placed humps; petiole directed posteroventrally (fig. 25) and is 70μ in width; basal piece of petiole open dorsally and bearing a pair of setae posteriorly; central piece of petiole widest anteriorly and very narrow posteriorly; figure 29 (subfigure at right) illustrates a posterodorsal view of the petiole; hyaline appendage short but wide; acetabular plates extending up sides of body to the level of the associated glandularia; a lateral extension of the coxal region noticeable in dorsal view (fig. 29); dorsal lengths of the palpal segments: P-I, 35μ; P-II, 78μ; P-III, 61μ; P-IV, 87μ; P-V, 46μ; figure 26 illustrates the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 281μ; IV-Leg-5, 111μ; IV-Leg-6, 163μ; distal end of IV-Leg-4 extending well beyond the insertion of the fifth segment; fourth leg with swimming hairs; sixth segments of first and second legs with many short "swimming hairs".

Female: Unknown.

Holotype: Adult ♂, collected in West Clear Creek seven miles east of Camp Verde, Yavapai County, Arizona, October 24, 1970.

Discussion: The new species, although not closely related, seems to have affinities with *A. harperae*. It differs in that the dorsal hump extends much farther posteriorly, the petiole is directed more posteroventrally, and the posterior pair of glandularia of the dorsal shield are not close together. Also, the new species is proportionally narrower and the central piece of the petiole is not widened posteriorly (compare figs. 29, 32).

11. Arrenurus (Arrenurus) wilsoni, new species

(Figures 33-36)

Male: Body, including petiole, 1018μ (1018μ-1140μ) in length, 722μ (714μ-821μ) in width; pygal lobes moderately developed and directed posterolaterally; width between outer margins of pygal lobes 562μ (547μ-638μ); dorsal shield 486 (416μ-532μ) in width; dorsal furrow passing onto sides of body at base of pygal lobes; non-cauda portion of dorsal shield bearing two pairs of glandularia, second pair located on a pair of dorsal humps; humps on dorsal shield bluntly pointed and directed more or less upwards when viewed laterally (fig. 35) and only very slightly depressed between the humps; anterior end of body projecting and decidedly concave between the eyes; lateral humps on dorsal portion of ventral shield relatively low (fig. 35); petiole approximately 216μ in length, 89μ (89μ-96μ) in width; basal piece of petiole open dorsally and bearing a pair of lateral setae; central piece of petiole broadening posteriorly and somewhat truncate at posterior end; structure and proportions of petiole better illustrated (figs. 34, 35) than described; hyaline appendage short and very wide; acetabular plates extending up sides of body beyond the associated glandularia; dorsal lengths of the palpal segments: P-I, 34μ; P-II, 78μ; P-III, 66μ; P-IV, 85μ; P-V, 47μ; structure of palp as shown for the female; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal extension), 348μ; IV-Leg-5, 137μ; IV-Leg-6, 163μ; distal end of IV-Leg-4 extending far beyond the insertion of the fifth segment; third and fourth legs with numerous, second leg with several long swimming hairs; sixth segments of first and second legs with many short "swimming hairs".

Female: Body 1322μ (1316μ-1444μ) in length, 1124μ (1064μ-1147μ) in width; anterior end of body slightly projecting and slightly concave between the eyes; body oval and without prominent humps; dorsal furrow complete; dorsal shield 973μ (927μ-1049μ) in length, 729μ (684μ-748μ) in width; dorsal shield bearing three pairs of glandularia; acetabular plate region 623μ (608μ-635μ) in width; gonopore 182μ (178μ-194μ) in width; figure 33 illustrates the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, 37μ; P-II, 89μ; P-III, 72μ; P-IV, 96μ; P-V, 55μ; figure 36 shows the structure of the palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, 170μ; I-Leg-5, 177μ; I-Leg-6, 181 μ; third and fourth legs with many, second leg with a few long swimming hairs.

Holotype: Adult ♂, taken in a pond beside Highway US 85 approximately one mile north of the Socorro County line, Bernalillo County, New Mexico, October 19, 1970.

Allotype: Adult ♀, same data as holotype.

Paratypes: 5 ♂♂, 9 ♀♀, same data as holotype.

Discussion: The new species seems most closely related to *A. dentipetiolatus* Marshall, but differs most noticeably in that *wilsoni* has a much higher hump on the dorsal shield and the posterior end of the basal piece of the petiole is downturned when viewed laterally (fig. 35). Also, the central piece of the petiole is much wider posteriorly in the new species.

12. Arrenurus (Arrenurus) beltistus, new species

(Figures 49-51)

Male: Body, including petiole, 1262μ (1262μ-1322μ) in length, 768μ (768μ-836μ) in width; pygal lobes well developed and directed more or less posteriorly; width between outer margins of pygal lobes 616μ (616μ-653μ); dorsal shield 547μ (543μ-570μ) in width; dorsal furrow passing onto sides of body at base of pygal lobes; non-cauda portion of dorsal shield bearing two pairs of glandularia, second pair located on a well developed single, rounded median hump; anterior end of body projecting and not concave between the eyes; lateral humps on dorsal portion of the ventral shield moderately developed (fig. 50); petiole approximately 275μ in length; 192μ in width; petiole open dorsally and with a median keel ventrally on the inside; petiole bearing a pair of prominent lateral setae (fig. 49); proportions of petiole better illustrated (figs. 49, 50) than described; hyaline appendage short but very wide; acetabular plates extending up sides of body far beyond the associated glandularia; excretory pore located on a prominent tubercle; dorsal lengths of the palpal segments: P-I, 31μ; P-II, 87μ; P-III, 59μ; P-IV, 98μ; P-V, 52μ; figure 51 illustrates the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 479μ; IV-Leg-5, 122μ; IV-Leg-6, 160μ; distal end of IV-Leg-4 extending well beyond insertion of the fifth segment; well developed swimming hairs present on third and fourth legs; sixth segments of first and second legs with a series of short "swimming hairs".

Female: Unknown.

Holotype: Adult ♂, collected in a lake near Mill Dam in Ocala National Forest, Marion County, Florida, November 19, 1970.

Paratypes: 2 ♂♂, from a borrow pit beside Highway 2 (approximately 11 miles east of the Columbia County line), Baker County, Florida, November 21, 1970.

Discussion: Possession of a single dorsal hump and general structure of the petiole seems to relate the new species with members of the *superior*-group. It differs from all other known members of the group, except *A. uniprojectus* Wilson, in bearing a pair of setae on the petiole. *A. beltistus* differs from the latter in its shorter dorsal hump and proportionally much wider cauda and petiole.

13. Arrenurus (Arrenurus) facetus, new species

(Figures 37-40, 48)

Male: Body, including petiole, 1991μ (1869μ-1991μ) in length, 1109μ (1094μ-1125μ) in width; pygal lobes well developed and projecting posterolaterally; width between outer margins of pygal lobes 1048μ (988μ-1048μ); dorsal shield 836μ (783μ-836μ) in width; dorsal furrow passing onto sides of body at base of pygal lobes; non-cauda portion of dorsal shield bearing two pairs of glandularia, second pair located on a well developed median hump; glandularia of the dorsal hump relatively close together (distance between them 334μ-365μ); dorsal shield, when viewed laterally, concave posterior to the dorsal hump (fig. 39); anterior end of body projecting and decidedly concave between the eyes; lateral humps on dorsal portion of the ventral shield moderately developed; petiole 252μ (220μ-252μ) in length, 192μ (162μ-192μ) in width; petiole open dorsally and slightly widened near posterior end (fig. 38); petiole without a median keel; figures 38 and 39 show the structure of the petiole; hyaline appendage very small; acetabular plates extending up sides of body somewhat beyond the associated glandularia; area of body between the fourth coxae and acetabular plates, when viewed laterally, rounded (i.e., there are no prominent glandularia tubercles in this position); dorsal lengths of the palpal segments: P-I, 59μ; P-II, 155μ; P-III, 104μ; P-IV, 163μ; P-V, 103μ; structure of palp similar to that shown for the female; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 669μ; IV-Leg-5, 282μ; IV-Leg-6, 342μ; second, third and fourth legs with swimming hairs; sixth segments of first and second legs with many short "swimming hairs".

Female: Body 2006μ (1930μ-2082μ) in length, 1535μ (1505μ-1581μ) in width; anterior end of body projecting and slightly concave between the eyes; ventral shield oval, with two pairs of prominent tubercles posteriorly and a dorsal pair located somewhat anterolateral to the dorsal shield; dorsal furrow complete; dorsal shield bearing three pairs of glandularia, the most posterior pair of which are located on slightly raised tubercles; dorsal shield 1322μ (1322μ-1398μ) in length, 1018μ (1018μ-1094μ) in width; acetabular plate region 1292μ (1277μ-1305μ) in width; gonopore 228μ (212μ-228μ) in width; figure 37 illustrates the structure of the ventral shield; no prominent glandularia tubercles present between the fourth coxae and genital field; dorsal lengths of the palpal segments: P-I, 59μ; P-II, 155μ; P-III, 115μ; P-IV, 192μ; P-V, 99μ; figure 40 shows the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, 373μ; I-Leg-5, 312μ; I-Leg-6, 395μ; all legs with swimming hairs, but only a few present on the first legs.

Holotype: Adult ♂, collected in a lake near Mill Dam in Ocala National Forest, Marion County, Florida, November 19, 1970.

Allotype: Adult ♀, same data as holotype.

Paratypes: 1 ♂, 6 ♀♀, same data as holotype; 4 ♂♂, from a lake in Ocala National Forest on Highway 40 one mile east of junction with Highway 19, Lake County, Florida, November 19, 1970.

Discussion: The present species belongs to the *superior*-group but is not closely related to any previously described *Arrenurus* (but see the following species). *A. facetus* and the following, *A. facetopsis*, differ among other things in having simple petioles which lack a median keel.

14. Arrenurus (Arrenurus) facetopsis, new species

(Figures 41, 53)

Male: Body, including petiole, 2006μ (1915μ-2006μ) in length, 1185μ (1185μ-1216μ) in width; pygal lobes well developed and projecting posterolaterally; width between outer margins of pygal lobes 1201 μ (1140μ-1216μ); dorsal shield 901μ (882μ-957μ) in width; dorsal furrow passing onto the sides of body at base of pygal lobes; non-cauda portion of dorsal shield bearing two pairs of glandularia, second pair located on a well developed median hump; glandularia of the dorsal hump relatively far apart (distance between them 502μ-547μ); dorsal shield, when viewed laterally not concave posterior to the dorsal hump glandularia (fig. 41); anterior end of body projecting and decidedly concave between the eyes; lateral humps on dorsal portion of ventral shield well developed and roundly pointed; petiole 281μ (248μ-281μ) in length, 187μ (159μ-187μ) in width; petiole similar to that described for the preceding species; hyaline appendage very small; acetabular plates extending up sides of body slightly beyond the associated glandularia; area of body between the fourth coxae and genital field, when viewed laterally, decidedly angled (there are prominent glandularia tubercles in this position); dorsal lengths of the palpal segments: P-I, 56μ; P-II, 141μ; P-III, 111μ; P-IV, 177μ; P-V, 108μ; structure of palp similar to that of the preceding species; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 699μ; IV-Leg-5, 297μ; IV-Leg-6, 327μ; swimming hairs as described for the preceding species.

Female: Very similar to females of the preceding species and separation of the two is not certain. However, females in which epimeroglandularia 2 lie on pronounced tubercles (giving the angled appearance to the area between the fourth coxae and genital field as shown for the male, figure 41) are assumed to be members of the present species. The body projections tend to be more pronounced in females assigned to *facetopsis*. Body 2006μ-2128μ in length, 1489μ-1520μ in width; dorsal shield 1155μ-1246μ in length, 904μ-988μ in width; acetabular plate region 1155μ-1216μ in width; gonopore 212μ-232μ in width; palp and legs as described in the preceding species.

Holotype: Adult ♂, collected in a lake in Ocala National Forest on Highway 40 one mile east of junction with Highway 19, Lake County, Florida, November 19, 1970.

Allotype: Adult ♀, same data as holotype.

Paratypes: 5 ♂♂, 7 ♀♀, same data as holotype; 1 ♂, 1 ♀, taken in a lake near Mill Dam in Ocala National Forest, Marion County, Florida, November 19, 1970.

Discussion: The present species is closely related to *A. facetus*, but differs in both sexes in possessing prominent glandularia tubercles immediately posterior to the fourth coxae. Males also differ in a number of additional characteristics. In facetopsis the humps on the dorsal portion of the ventral shield are higher and more pointed, and the large hump on the dorsal shield is not concave posterior to the associated glandularia (compare figures 39, 41). In dorsal view, the glandularia of the dorsal shield hump are much farther apart in the present species (compare figures 38, 53).

15. Arrenurus (Arrenurus) omarus, new species

(Figures 42, 45, 52)

Male: Body, including petiole, 1611μ in length, 927μ in width; pygal lobes relatively long and projecting posterolaterally; width between outer margins of pygal lobes 958μ; dorsal shield 638μ in width; dorsal furrow passing onto sides of body at base of pygal lobes; non-cauda portion of dorsal shield bearing two pairs of glandularia, second pair located on a single low median hump; glandularia on dorsal hump relatively close together (distance between them 327μ); anterior end of body projecting and concave between the eyes; lateral humps on dorsal portion of ventral shield well developed; petiole approximately 229μ in length, 110μ in width; petiole widest near base; petiole open dorsally and with a median keel ventrally on inside; outer edges of petiole wavy; hyaline appendage short and somewhat rounded posteriorly; acetabular plates extending up sides of body slightly beyond the associated glandularia; dorsal lengths of the palpal segments: P-I, 44μ; P-II, 111μ; P-III, 81μ; P-IV, 145μ; P-V, 82μ; figure 42 illustrates the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 586μ; IV-Leg-5, 232μ; IV-Leg-6, 243μ; fourth leg with swimming hairs; sixth segments of first and second legs with many short "swimming hairs".

Female: Unknown.

Holotype: Adult ♂, collected in a lake near Mill Dam in Ocala National Forest, Marion County, Florida, November 19, 1970.

Discussion: The new species belongs to the *A. superior*-group and seems most closely related to *A. wallensis* Cook, the latter known from Michigan. *A. omarus* differs most noticeably in proportions of the petiole. The petiole of the present species is much narrower (compare figures 46, 52) and is downturned at the posterior end when viewed laterally (compare figures 45, 47). Also, the southern species is somewhat smaller and the glandularia on the dorsal hump are farther apart (273μ for *wallensis*, 327μ for *omarus*).

16. Arrenurus (Arrenurus) parasuperior, new species

(Figures 43, 44, 60)

Male: Body, including petiole, 1641μ (1641μ-1702μ) in length, 897μ (897μ-973 μ) in width; pygal lobes relatively well developed and directed more or less posteriorly; width between outer margins of pygal lobes 760μ (752μ-806μ); dorsal shield 623μ (623μ-662μ) in width; dorsal furrow passing onto sides of body at base of pygal lobes; dorsal shield bearing two pairs of glandularia in the non-cauda portion; second pair of glandularia located on a single, moderately developed dorsal hump; dorsal hump, when viewed laterally, distinctly concave posterior to the dorsal hump glandularia (fig. 43); anterior end of body projecting but not concave between the eyes; lateral humps on dorsal portion of ventral shield well developed; petiole 255μ (222μ-255μ) in length, 196μ (192μ-214μ) in width; petiole open dorsally and with a well developed median keel ventrally on inner side; outer edges expanded into wing-like extensions; proportions of petiole better illustrated (figs. 43, 60) than described; hyaline appendage small; acetabular plates extending up sides of body slightly beyond the associated glandularia; dorsal lengths of the palpal segments: P-I, 46μ; P-II, 104μ; P-III, 66μ; P-IV, 122μ; P-V, 81μ; figure 44 shows the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 502μ; IV-Leg-5, 194μ; IV-Leg-6, 213μ; fourth leg with many, third leg with a few swimming hairs; sixth segments of first and second legs with numerous short "swimming hairs".

Female: Not known with certainty.

Holotype: Adult ♂, collected in a pond beside Highway US 90 two miles east of Ponce de Leon, Holmes County, Florida, November 8, 1970.

Paratypes: 2 ♂♂, same data as holotype; 3 ♂♂, taken in a lake in Ocala National Forest (on Highway 40 one mile east of junction with Highway 19), Lake County, Florida, November 19, 1970; 2 ♂♂, from a borrow pit beside Highway 2 (approximately 11 miles east of the Columbia County line), Baker County, Florida, November 21, 1970.

Discussion: The new species belongs to the *A. superior*-group and is somewhat intermediate in character between *superior* Marshall and pseudosuperior Cook. It is smaller than *superior*, with a less angular body and proportionally shorter petiole. It differs from *pseudosuperior* in its wider wing-like extensions on the petiole, higher lateral humps on the dorsal portion of the ventral shield, proportionally narrower body and concave area posterior to the hump glandularia of the dorsal shield when viewed laterally (fig. 43).

17. Arrenurus (Arrenurus) ziseri, new species

(Figures 57-59)

Male: Body, including petiole, 1064μ (988μ-1064μ) in length, 730μ (700μ-730μ) in width; pygal lobes short and directed posterolaterally; width between outer margins of pygal lobes 486μ (456μ-486μ); dorsal shield 380μ (380μ-388μ) in width; dorsal furrow incomplete and ending dorsally at base of pygal lobes; dorsal shield bearing two pairs of glandularia but no pronounced humps; anterior end of body projecting and distinctly concave between the eyes; lateral humps on dorsal portion of ventral shield high and placed relatively far posteriorly; petiole approximately 281μ (252μ-281μ) in length, 96μ (71μ-96μ) in width near posterior end; body pores extending out onto most of petiole and a pair of setae located in the basal half; petiole not open dorsally and is expanded near posterior end when viewed dorsally (fig. 57); very thin hyaline membranes extending ventrolaterally in the posterior half of the petiole (fig. 58); no hyaline appendage present; acetabular plates extending only a short distance up sides of body; dorsal lengths of the palpal segments: P-I, 37μ; P-II, 81μ; P-III, 59μ; P-IV, 95μ; P-V, 48μ; figure 59 shows the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, 214μ; IV-Leg-5, 174μ; IV-Leg-6, 181μ; distal end of IV-Leg-4 extending only slightly beyond insertion of the fifth segment; fourth leg with swimming hairs; sixth segments of first and second legs with a few short "swimming hairs".

Female: Unknown.

Holotype: Adult ♂, collected in a pond beside Highway 48, nine miles northwest of Bushnell, Citrus County, Florida, November 11, 1970.

Paratype: 1 ♂, taken in a Cypress swamp five miles southeast of Sorrento, Ascension Parish, Louisiana, September 27, 1974 (leg. Ziser).

Discussion: The present species, named for Steve Ziser who collected the paratype specimen, is most closely related to *A. trifoliatus* Marshall. However, the latter has a shorter petiole which extends posteroventrally rather than more or less straight back as in the new species. Also, the present species bears two ventrolaterally directed hyaline extensions of the petiole. In *trifoliatus*, there are three somewhat bag-like hyaline extensions attached to the posterior end of the petiole.

18. Arrenurus (Micruracarus) hovus, new species

(Figures 66, 67, 69, 70, 75)

Male: Body 1216μ (1140μ-1216μ in length, 882μ (866μ-913μ) in width; cauda short but 768μ (727μ-768μ) in width; structure of the cauda very complex, its morphology better illustrated (figs. 70, 75) than described; cauda cleft posteriorly (this best seen in ventral view, and is similar to that of *lyriger* Marshall); dorsal shield small but bearing two pairs of glandularia; setae of dorsal shield shortened and thickened; dorsal shield 440μ (410μ-440μ) in width; a narrow sclerotized bridge connecting the petiole with the dorsal shield (fig. 70); anterior end of body projecting and decidedly concave between the eyes; lateral humps on dorsal portion of ventral shield very high (fig. 75); petiole (shown in stipple in figure 70) 136μ in width; acetabular plates extending far up the sides of the body; dorsal lengths of the palpal segments: P-I, 44μ; P-II, 96μ; P-III, 63μ; P-IV, 89μ; P-V, 52μ; medial surface of P-II with a patch of numerous setae as shown for the female; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, 252μ; IV-Leg-5, 222μ; IV-Leg-6, 229μ; distal end of IV-Leg-4 extending only slightly beyond the insertion of the fifth segment; third and fourth legs with swimming hairs; sixth segments of first and second legs with many short "swimming hairs".

Female: Body 1292μ (1292μ-1353μ) in length, 1079μ (1079μ-1140μ) in width; anterior end projecting and concave between the eyes as in male; ventral shield wide posteriorly and with posterolateral humps; a pair of prominent lateral humps present on dorsal portion of ventral shield and a pair of small but prominent humps lateral to the excretory pore; dorsal furrow complete; dorsal shield 790μ (775μ-806μ) in length, 684μ (684μ-744μ) in width; dorsal shield bearing three pairs of glandularia, associated setae of first two pairs short and somewhat thickened, those of the posterior pair long and hair-like (fig. 69); acetabular plate region 836μ in width; gonopore 258μin width; dorsal lengths of the palpal segments: P-I, 48μ; P-II, 92μ; P-III, 64μ; P-IV, 100μ; P-V, 56μ; medial surface of P-II with an extensive patch of shortened, thickened setae (fig. 67); dorsal lengths of the distal segments of the first leg: I-Leg-4, 192μ; I-Leg-5, 192μ; I-Leg-6, 222μ; third and fourth legs with many, second leg with a few swimming hairs.

Holotype: Adult ♂, collected in a pond beside Highway 31 (five miles north of the Lee County line), Charlotte County, Florida, November 13, 1970.

Allotype: Adult ♀, same data as holotype.

Paratypes: 2 ♂♂, 2 ♀♀, same data as holotype: 1♂, collected in a roadside pond five miles west of "Grower's Corners", Pasco County, Florida, April 9, 1950.

Discussion: The present species seems most closely related to *A. lyriger* Marshall but differs in a number of characteristics. *A. hovus* has the dorsal humps of the ventral shield and dorsal portion of the cauda much higher when viewed laterally. The structure of the petiole and proportions of the cauda are also very different in the new species.

19. *Arrenurus* (*Micruracarus*) *immokaleensis*, new species

(Figures 56, 68, 77)

Male: Body 805μ (791μ-821μ) in length, 684μ (684μ-730μ) in width; cauda short but 474μ (462μ-474μ) in width; median cleft of cauda very wide; there is a slight concavity anterior to the median cleft, this concavity with a distinct band ventrally(fig. 56); figures 56 and 77 illustrate dorsal and lateral views respectively of the cauda; dorsal shield relatively large and bearing two pairs of glandularia; a short setae-bearing projection present at posterior end of dorsal shield; dorsal shield 456μ (425μ-456μ) in width; anterior end of body projecting but only slightly concave between the eyes; lateral humps on dorsal portion of ventral shield relatively high (fig. 77); acetabular plates extending well up sides of body; dorsal lengths of the palpal segments: P-I, 33μ; P-II, 85μ; P-III, 54μ; P-IV, 85μ; P-V, 42μ; medial surface of P-II with a large patch of short, somewhat thickened setae; figure 68 illustrates the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, 200μ; IV-Leg-5, 185μ; IV-Leg-6, 185μ; distal end of IV-Leg-4 projecting only slightly beyond the insertion of IV-Leg-5; third and fourth legs with well developed swimming hairs, second leg with a few shorter swimming hairs.

Female: Unknown.

Holotype: Adult ♂, collected in an artificial pond along Highway 29 one mile north of Immokalee, Collier County, Florida, November 16, 1970.

Paratypes: 1 ♂, same data as holotype; 1 ♂, taken in a lake near Mill Dam in Ocala National Forest, Marion County, Florida, November 19, 1970.

Discussion: The combination of a large dorsal shield, complete dorsal furrow, concavity at the base of the cauda and lack of a petiole will distinguish the present species from all other North American species of the subgenus *Micruracarus*.

20. *Arrenurus* (*Micruracarus*) *neocrenellatus*, new species

(Figures 55, 62, 65, 71, 74)

Male: Body 806μ (806μ-851μ) in length, 669μ (669μ-758μ) in width; cauda short and 456μ (456μ-502) in width; median cleft well developed; cauda area with a slight concavity; a small peg-like petiole lying in this concavity (fig. 55); posterolateral corners of cauda somewhat projecting; dorsal shield relatively large and bearing three pairs of glandularia (two pairs anterior to the base of the cauda); dorsal shield truncate posteriorly; width of dorsal shield 441μ (434μ-456μ); anterior end of body projecting and somewhat concave between the eyes; lateral humps on dorsal portion of ventral shield relatively well developed (fig. 62); acetabular plates extending well up onto sides of body; dorsal lengths of the palpal segments: P-I, 37μ; P-II, 81μ; P-III, 52μ; P-IV, 70μ; P-V, 41μ; medial surface of P-II with a patch of numerous short setae as illustrated in figure 65 for the female; dorsal lengths of the distal segments of fourth leg: IV-Leg-4, 177μ; IV-Leg-5, 166μ; IV-Leg-6, 170μ; distal end of IV-Leg-4 extending only slightly beyond insertion of fifth segment; second, third and fourth legs with swimming hairs, but only a few present on second leg.

Female: Body 973μ (973μ-1064μ) in length, 851μ (851μ-897μ) in width; anterior end of body slightly projecting and somewhat concave between the eyes (similar to that of male); ventral shield widest near middle, with only slightly developed posterolateral humps; a pair of prominent lateral humps present on dorsal portion of ventral shield; dorsal furrow complete; dorsal shield 753μ (753μ-805μ) in length, 562μ (562μ-631μ) in width; dorsal shield bearing three pairs of glandularia; acetabular plate region 570μ in width; gonopore 156μ in width; figure 71 shows the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, 39μ; P-II, 96μ; P-III, 54μ; P-IV, 74μ; P-V, 44μ; P-II with a medial patch of short, thickened setae; figure 65 shows the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, 140μ; I-Leg-5, 155μ; I-Leg-6, 167μ; swimming hairs present on second, third and fourth legs but only a few on the second segment.

Holotype: Adult ♂, found in a small pond beside Highway 37 (slightly south of the Hillsborough County line), Manatee County, Florida, November 12, 1970.

Allotype: Adult ♀, same data as holotype.

Paratypes: 24 ♂♂, 1 ♀, same data as the holotype; 1 ♂, taken in a borrow pit beside Highway 94 near junction with Highway US 441 (this is an overflow area of the Suwannee River), Clinch County, Georgia, November 21, 1970.

Discussion: The new species is closely related to *A. crenellatus* Marshall, the latter known from northeastern North America. *A. neocrenellatus* differs most noticeably in its more projecting anterior end with a distinct concavity between the eyes (fig. 55) and the relatively high humps on the dorsal portion of the ventral shield (fig. 62).

21. Arrenurus (Micruracarus) floridensis, new species

(Figures 54, 61, 63, 64, 73)

Male: Body 897μ in length, 744μ in width; cauda short and 532μ in width; median cleft well developed but extremely narrow; entire cauda area with a shallow concavity; another much smaller and deeper concavity present near the midline (shown in stipple in figure 54); this latter concavity flanked by a pair of recurved, hook-like processes; posterolateral corners of cauda somewhat projecting; dorsal shield relatively large and bearing two pairs of glandularia; dorsal furrow passing onto sides of body at base of cauda and ending blindly here; width of dorsal shield 494μ; anterior end of body projecting and not concave between the eyes; lateral humps on dorsal portion of ventral shield moderately developed (fig. 61); acetabular plates extending far up sides of body; dorsal lengths of the palpal segments: P-I, 28μ; P-II, 76μ; P-III, 59μ; P-IV, 62μ; P-V, 33μ; median surface of P-II with three or four long setae as shown for the female (fig. 64); dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, 192μ; IV-Leg-5, 185μ; IV-Leg-6, 155μ; distal end of IV-Leg-4 extending only slightly beyond the insertion of IV-Leg-5; second, third and fourth legs with swimming hairs but these few in number on the second legs.

Female: Body 973μ in length, 874μ in width; anterior end of body projecting but not concave between the eyes; ventral shield with moderately developed posterolateral humps; a pair of prominent lateral humps present on dorsal portion of ventral shield; dorsal furrow complete; dorsal shield 729μ in length, 570μ in width; dorsal shield bearing three pairs of glandularia, setae associated with posterior pair of glandularia very long; acetabular plate region 753μ in width, gonopore 182μ in width; figure 63 illustrates the proportions of the ventral shield; dorsal lengths of the palpal segments: P-I, 33μ; P-II, 74μ; P-III, 54μ; P-IV, 69μ; P-V, 39μ; figure 64 illustrates the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, 132μ; I-Leg-5, 133μ; I-Leg-6, 148μ; all legs with swimming hairs but those on first leg short and few in number.

Holotype: Adult ♂, collected in a borrow pit near Ocean Pond in Osceola National Forest, Baker County, Florida, November 21, 1970.

Allotype: Adult ♀, same data as holotype.

Discussion: *A. floridensis* somewhat resembles *A. bicaudatus* Marshall and *A. acutus* Marshall. However, the male of the new species has a much narrower posteromedian cleft, has a much deeper posterior concavity and possesses hook-like projections flanking this concavity (fig. 54).

22. Arrenurus (Megaluracarus) veracundus, new species

(Figures 76, 78, 79, 83, 84)

Male: Body 765μ (765μ-882μ) in length, 479μ (479μ-577μ) in width; cauda of moderate length and 228μ (228μ-281μ) in width; dorsal shield 357μ (357μ-410μ) in width; non-cauda portion of dorsal shield bearing two pairs of glandularia, the most posterior pair of which are much closer together medially; cauda only slightly narrower posteriorly and without a median cleft or petiole; dorsal furrow passing ventrally at base of cauda and continuing immediately posterior to the acetabular plates; cauda abruptly set off from remainder of body when viewed laterally (fig. 78); anterior end of body slightly projecting but not concave between the eyes; no humps present on dorsal portion of ventral shield; acetabular plates extending slightly up sides of body but not as far as the associated glandularia; dorsal lengths of the palpal segments: P-I, 27μ; P-II, 62μ; P-III, 40μ; P-IV, 69μ; P-V, 34μ; figure 79 illustrates the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 192μ; IV-Leg-5, 155μ; IV-Leg-6, 141μ; distal end of IV-Leg-4 extending somewhat beyond the insertion of IV-Leg-5; third and fourth legs with well developed swimming hairs.

Female: Body 714μ (684μ-714μ) in length, 623μ (577μ-638μ) in width; anterior end of body projecting but not concave between the eyes (as in male); ventral shield more or less oval but very slightly indented posterolaterally (fig. 84); dorsal shield bearing three pairs of glandularia but no humps; dorsal furrow complete; dorsal shield 577μ (548μ-577μ) in length, 486μ (456μ-492μ) in width; acetabular plate region 440μ in width, gonopore 115μ in width; figure 83 shows the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, 28μ; P-II, 66μ; P-III, 47μ; P-IV, 73μ; P-V, 34μ; palp similar to that illustrated for the male: dorsal lengths of the distal segments of the first leg: I-Leg-4, 107μ; I-Leg-5, 110μ; I-Leg-6, 111μ; third and fourth legs with swimming hairs.

Holotype: Adult ♂, collected in a pond beside Highway US 90 two miles east of Ponce de Leon, Holmes County, Florida, November 8, 1970.

Allotype: Adult ♀, same data as holotype.

Paratypes: 5 ♂♂, 2 ♀♀, same data as holotype; 5 ♂♂, 4 ♀♀, taken in a lily pond beside Highway 79 (near junction with Highway 280), Washington County, Florida, November 9, 1970; 7 ♂♂, 2 ♀♀, taken in a small lake 12 miles south of Minneola on Highway US 27, Polk County, Florida, November 17, 1970; 1 ♂, from a lake near Mill Dam in Ocala National Forest, Marion County, Florida, November 19, 1970.

Discussion: The new species belongs to the *A. birgei*-group but differs from all other North American members in having a proportionally much longer and narrower cauda in the male.

23. Arrenurus (Megaluracarus) succissus, new species

(Figures 80, 81, 87)

Male: Body 714μ (714μ-783μ) in length, 471μ (458μ-401μ) in width; cauda of moderate length and 243μ (243μ-274μ) in width; dorsal shield 365μ (344μ-380μ) in width; non-cauda portion of dorsal shield bearing two pairs of glandularia, the more posterior pair of which are much closer together medially; cauda gradually narrowing posteriorly and without a median cleft or petiole; dorsal furrow passing ventrally at base of cauda and continuing immediately posterior to the acetabular plates; cauda, when viewed laterally, not distinctly set off from the body as in the previous species (fig. 87); anterior end of body slightly projecting but not concave between the eyes; no humps present on the dorsal shield; acetabular plates extending slightly up sides of body almost to the associated glandularia; dorsal lengths of the palpal segments: P-I, 27μ; P-II, 55μ; P-III, 38μ; P-IV, 63μ; P-V, 31μ; figure 81 shows the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 189μ; IV-Leg-5, 152μ; IV-Leg-6, 133μ; distal end of IV-Leg-4 extending somewhat beyond insertion of fifth segment; third and fourth legs with well developed swimming hairs.

Female: Not recognized with certainty.

Holotype: Adult ♂, collected in a cypress swamp on Highway 87 (near junction with Highway S-182), Santa Rosa County, Florida, November 8, 1970.

Paratypes: 1 ♂, same data as holotype; 1 ♂, collected in a pond beside State Highway 51, three miles north of Clara, Lafayette County, Florida, November 10, 1970; 18 ♂♂, from a pond beside Highway 48, nine miles northwest of Bushnell, Citrus County, Florida, November 11, 1970; 9 ♂♂, collected in a lily pond beside Highway 72, about 3.5 miles west of entrance to Myakka River State Park, Sarasota County, Florida, November 13, 1970; 11 ♂♂, found in an artificial pond beside Highway 29 one mile north of Immokalee, Collier County, Florida, November 16, 1970; 1 ♂, from a lake near Mill Dam in Ocala National Forest, Marion County, Florida, November 19, 1970; 6 ♂♂, from a small pond in Pinellas County, Florida, April 12, 1950.

Discussion: The present species belongs to the *A. birgei*-group and, in fact, is very closely related to *birgei*. The new species differs most noticeably in that the cauda gradually tapers towards the posterior end and there are no pronounced indentations at the posterolateral corners of the cauda (fig. 80). *A. birgei* males have a parallel sided cauda and there are indentations at the posterolateral corners. The two species appear very similar in lateral view.

24. Arrenurus (Megaluracarus) zorus, new species

(Figures 72, 82, 89, 90)

Male: Body 897μ (866μ-905μ) in length, 532μ (525μ-570μ) in width; cauda of moderate length and 289μ (289μ-319μ) in width; dorsal shield 395μ (382μ-403μ) in width; non-cauda portion of dorsal shield bearing two pairs of glandularia, the more posterior pair of which are only slightly closer together medially than the anterior pair; cauda narrowest at base and gradually widening posteriorly (fig. 82); cauda without a median cleft or petiole; dorsal furrow passing ventrally at base of cauda and continuing immediately posterior to the acetabular plates; cauda abruptly set off from the remainder of the body when viewed laterally (fig. 89); anterior end of body somewhat projecting, but not concave between the eyes; no large humps present on dorsal portion of ventral shield; acetabular plates extending only slightly up sides of body and not reaching the associated glandularia; anterior two pairs of coxae relatively sharp-pointed; dorsal lengths of the palpal segments: P-I, 29μ; P-II, 61μ; P-III, 46μ; P-IV, 70μ; P-V, 37μ; medial surface of P-II with a patch of many thickened setae some of which are downturned at the tip; figure 90 shows the structure of these setae and the proportions of the palpal segments; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 214μ; IV-Leg-5, 170μ; IV-Leg-6, 185μ; distal end of IV-Leg-6 projecting well beyond insertion of fifth segment; third and fourth legs with well developed swimming hairs, second leg with a few swimming hairs.

Female: Body 890μ (821μ-912μ) in length, 768μ (714μ-775μ) in width; anterior end of body projecting but not concave between the eyes; ventral shield somewhat oval but distinctly angular; dorsal shield with three pairs of glandularia but no humps; dorsal furrow complete; dorsal shield 714μ (668μ-722μ) in length, 577μ (540μ-584μ) in width; acetabular plate region not extending far laterally (fig. 72), width of acetabular plate region 355μ (355μ-363μ); gonopore 126μ (118μ-132μ) in width; dorsal lengths of the palpal segments: P-I, 33μ; P-II, 66μ; P-III, 49μ; P-IV, 74μ; P-V, 32μ; structure of palp similar to that illustrated for the male; dorsal lengths of the distal segments of the first leg: I-Leg-4, 122μ; I-Leg-5, 141μ; I-Leg-6, 144μ; third and fourth legs with several swimming hairs, second leg with a few swimming hairs, first leg with two short swimming hairs.

Holotype: Adult ♂, collected in a pond beside Highway 31 (five miles north of the Lee County line), Charlotte County, Florida, November 13, 1970.

Allotype: Adult ♀, same data as holotype.

Paratypes: 2 ♂♂, from Big Alligator Lake, Columbia County, Florida, April 9, 1950; 2 ♂♂, from a pond three miles north of Clara, Lafayette County, Florida, November 10, 1970; 1 ♂ collected in Lake Tsala Apopka, Citrus County, Florida, November 11, 1970; 2 ♂♂, from a pond nine miles northwest of Bushnell, Citrus County, Florida, November 11, 1970; 1 ♂, from a small lake two miles south of Avon Park, Highlands County, Florida, November 16, 1970; 2 ♂♂, from a small pond in Pinellas County, Florida, April 12, 1950; 3 ♂♂, 2 ♀♀, same data as holotype; 2 ♂♂, taken in a water filled ditch in Collier County, Florida, April 13, 1950; 2 ♂♂, found in a sluggish stream at Bridge 40 on Highway US 41, Collier County, Florida, November 14, 1970; 5 ♂♂, from the Tamiami Canal, Dade County, Florida, November 14, 1970; 5 ♂♂, from the Tamiami Canal, Dade County, Florida, April 13, 1950; 3 ♂♂, from a canal in Broward County, Florida, April 15, 1950.

Discussion: The new species is most closely related to *A. bartonensis* Cook, the latter described from Michigan, but also reported by Wilson (1961) from Tennessee. Both species bear a patch of many thickened setae on the medial surface of P-II as shown in figure 90. However, the male cauda is proportionally much longer in *zorus* and is not as high when viewed laterally.

25. Arrenurus (Megaluracarus) problecornis, new species

(Figures 85, 86, 88, 91, 95)

Male: Body 1186μ (1109μ-1186μ) in length, 578μ (576μ-593μ) in width; cauda long and 274μ (274μ-297μ) in width; dorsal shield 440μ (426μ-447μ) in width; non-cauda portion of dorsal shield bearing two pairs of glandularia, these very close together on their respective sides; cauda widest near posterior end; cauda with a distinct median cleft but lacking a petiole; cauda expanded dorsally into a well developed, somewhat oval hump which is best seen in lateral view (fig. 91); dorsal furrow passing ventrally at base of cauda and continuing immediately posterior to the acetabular plates; cauda abruptly set off from the remainder of the body and narrowed at this point; anterior end projecting and with a pair of well developed horn-like humps (fig. 86); a pair of pronounced humps present on dorsal portion of ventral shield, these relatively close to the anterior horn-like projections (fig. 91); acetabular plates extending slightly up sides of body; dorsal lengths of the palpal segments: P-I, 34μ; P-II, 66μ; P-III, 48μ; P-IV, 76μ; P-V, 36μ; medial surface of P-II with a patch of numerous short setae and one long, thickened, somewhat curved seta; figure 88 shows the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, 236μ; IV-Leg-5, 167μ; IV-Leg-6, 163μ; only the third and fourth legs with well developed swimming hairs.

Female: Body 988μ (927μ-988μ) in length, 806μ (760μ-806μ) in width; anterior end of body projecting much as in the male (fig. 95); ventral shield with numerous projections which are better illustrated (figs. 85, 95) than described; dorsal shield bearing three pairs of glandularia, the two most posterior pairs of which are located on pronounced humps; anterior end of dorsal shield depressed; dorsal furrow complete; dorsal shield 532μ (517μ-545μ) in length, 502μ (486μ-502μ) in width; acetabular plate region 517μ in width; gonopore 104μ in width; dorsal lengths of the palpal segments: P-I, 36μ; P-II, 76μ; P-III, 45μ, P-IV, 79μ; P-V, 39μ; structure of palp as described and illustrated for the male, dorsal lengths of distal segments of the first leg: I-Leg-4, 133μ; I-Leg-5, 148μ; I-Leg-6, 155μ; only third and fourth legs with well developed swimming hairs.

Holotype: Adult ♂, taken in a pond beside Highway US 90 two miles east of Ponce de Leon, Holmes County, Florida, November 8, 1970.

Allotype: Adult ♀, same data as holotype.

Paratypes: 8 ♂♂, 2 ♀♀, same data as holotype; 2 ♂♂, from a lily pond beside Highway 79 (near junction with Highway 280), Washington County, Florida, November 9, 1970; 10 ♂♂, 4 ♀♀, collected in a small lake 12 miles south of Minneola on Highway US 27, Polk County, Florida, November 17, 1970; 11 ♂♂, 11 ♀♀, from a lake near Mill Dam in Ocala National Forest, Marion County, Florida, November 19, 1970; 1 ♂, 1 ♀, found in a lake in Ocala National Forest (on Highway 40 one mile east of junction with Highway 19), Lake County, Florida, November 19, 1970; 1 ♂, from a borrow pit in Baker County, Florida, November 21, 1970; 4 ♂♂, from a roadside pond in Pasco County, Florida, April 9, 1950.

Discussion: The new species belongs to the *marshallae*-group and seems most closely related to *A. megalurus* Marshall. It differs from the latter in having higher humps (which are closer together on their respective sides) at the anterior end of the body and in lacking well developed posterolateral projections at the end of the cauda. The female bears more numerous and higher projections on both the dorsal and ventral shields than in any other member of the species group in North America.

26. Arrenurus (Megaluracarus) prodromocornis, new species

(Figures 96, 97, 99)

Male: Body 1064μ (1048μ-1094μ) in length, 555μ (517μ-578μ) in width; cauda long and 312μ (282μ-319μ) in width; dorsal shield 403μ (364μ-410μ) in width; non-cauda portion of dorsal shield bearing two pairs of glandularia, these very close together on their respective sides; cauda gradually widening towards the posterior end; cauda with a distinct medial cleft but no petiole; cauda only slightly expanded dorsally (fig. 97); dorsal furrow passing ventrally at base of cauda and continuing immediately posterior to the acetabular plates; cauda abruptly set off from the remainder of the body and narrowest at this point; anterior end of body projecting and with a pair of well developed horn-like humps (fig. 99); a pair of pronounced humps present on dorsal portion of ventral shield, these placed farther from the anterior horn-like projections than in the previous species; acetabular plates extending slightly up sides of body; dorsal lengths of the palpal segments: P-I, 37μ; P-II, 67μ; P-III, 44μ; P-IV, 70μ; P-V, 39μ; medial surface of P-II with a patch of numerous short setae and one long, curved somewhat thickened seta; figure 96 shows the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4, 207μ; IV-Leg-5, 192μ; IV-Leg-6, 177μ; distal end of IV-Leg-4 extending slightly beyond insertion of the fifth segment; third and fourth legs with well developed swimming hairs.

Female: Not known with certainty.

Holotype: Adult ♂, collected in a pond on the east side of the Aucilla River, Taylor County, Florida, November 10, 1970.

Paratypes: 12 ♂♂, same data as holotype; 1 ♂, from a pond three miles north of Clara, Lafayette County, Florida, November 10, 1970; 2 ♂♂, taken in a borrow pit beside Highway 2 (approximately 11 miles east of the Columbia County line), Baker County, Florida, November 21, 1970; 1 ♂, from a cypress pool in Pasco County, Florida, April 9, 1950; 1 ♂, from a borrow pit beside Highway 94 near the Suwannee River, Clinch County, Georgia, November 21, 1970; 11 ♂♂, from a roadside pond (a sluggish stream during the rainy season) on Highway US 441, immediately south of junction with Highway 122, Clinch County, Georgia, November 21, 1970.

Discussion: The new species seems closely related to the two North American species *A. intermedius* Marshall and *A. pseudotenuicollis* Wilson, but differs in its greater development of the anterior horn-like projections and lower dorsal bowing of the cauda (fig. 97).

Figures 88-90 illustrate a specimen collected in a pond beside Highway US 90 two miles east of Ponce de Leon, Holmes County, Florida, November 8, 1970. It differs from the specimens of *prodromocornis* in having a higher dorsal bowing of the cauda and a different shape of the cauda when viewed dorsally (compare figures 93, 99). More specimens need to be collected before it can be determined if it represents another species or only an extreme variation of the present species.

27. Arrenurus (Megaluracarus) rulumus, new species

(Figures 98, 109, 111)

Male: (Holotype mounted in side view, body measurements are those of paratypes); body 1216μ-1262μ in length, 669μ-676μ in width; cauda very long and narrow; greatest width of cauda 217μ-228μ; dorsal shield 668μ-677μ in width; non-cauda portion of dorsal shield bearing two pairs of glandularia, the posterior pair of which are much closer together medially; cauda widest near middle; cauda with a very slight median cleft but lacking a petiole; cauda with a series of dorsal shield humps which are best seen in lateral view (fig. 98); anterior hump of cauda relatively high; dorsal furrow passing ventrally at base of cauda; dorsal furrow incomplete, ending blindly on each side well posterior to the acetabular plates; cauda abruptly set off from the remainder of the body and slightly narrowed at this point; anterior end of body somewhat projecting and only slightly concave between the eyes; no noticeable development of humps on the dorsal portion of the ventral shield; acetabular plates extending slightly up sides of body; dorsal lengths of the palpal segments: P-I, 35μ; P-II, 69μ; P-III, 43μ; P-IV, 80μ; P-V, 37μ; one of the medial setae on P-II very long; figure 111 shows the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 273 μ; IV-Leg-5, 185μ; IV-Leg-6, 192μ; distal end of IV-Leg-4 extending well beyond insertion of the fifth segment; third and fourth legs with many well developed swimming hairs; sixth segments of first and second legs with numerous short "swimming hairs".

Female: Not known with certainty.

Holotype: Adult ♂, collected in a backwater area of the Santa Fe River, on Highway US 301 at county line, Alachua County, Florida, April 16, 1950.

Paratypes: 17 ♂♂, same data as holotype.

Discussion: The present species and the following, *A. pandarus*, are closely related to *A. elevatus* Marshall (the latter known from Maine). The northern species differs from both in having a more expanded posterior end of the cauda. The present species is similar to *elevatus* in lacking pronounced lateral humps on the dorsal portion of the ventral shield (fig. 98), but also differs in having a larger concavity posterior to the main dorsal hump of the cauda when viewed laterally. See discussion section under the following species for differences separating the two forms from Florida and Georgia.

28. Arrenurus (Megaluracarus) pandarus, new species

(Figures 100, 102, 103, 105, 106)

Male: Body 1398μ (1382μ-1414μ) in length, 760μ (760μ-821μ) in width; cauda very long and narrow; greatest width of cauda 266μ (266μ-280μ); dorsal shield 486μ (471μ-486μ) in width; non-cauda portion of dorsal shield bearing two pairs of glandularia, the posterior pair of which are much closer together medially; cauda widest near middle; cauda with a slight median indentation and a small depressed area immediately anterior to this indentation; no petiole present; cauda with a series of dorsally directed humps, the structure of which are best seen in lateral view (fig. 100); anterior hump of cauda moderately high; dorsal furrow passing ventrally at base of cauda; dorsal furrow incomplete, ending blindly on each side well posterior to the acetabular plates; cauda abruptly set off from the remainder of the body and somewhat narrowed at this point;

anterior end of body somewhat projecting and very slightly concave or almost truncate between the eyes; a pair of rounded, moderately developed humps present on dorsal portion of ventral shield; acetabular plates extending slightly up sides of body; dorsal lengths of the palpal segments: P-I, 30μ; P-II, 74μ; P-III, 43μ; P-IV, 86μ; P-V, 42μ; structure of palp similar to that illustrated for the female; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 296μ; IV-Leg-5, 200μ; IV-Leg-6, 229μ; distal end of IV-Leg-4 extending well beyond insertion of fifth segment; third and fourth legs with many well developed swimming hairs; sixth segments of first and second legs with numerous short "swimming hairs".

Female: Body 1140μ (1109μ-1186μ) in length, 972μ (972μ-988μ) in width; anterior end of body projecting much as in male (fig. 102); ventral shield somewhat angular but without distinct humps; dorsal shield bearing three pairs of glandularia, none of which lie on humps; dorsal furrow complete; dorsal shield 851μ (806μ-851μ) in length, 707μ (669μ-707μ) in width; acetabular plate region 577μ (565μ-592μ) in width; gonopore 155μ (148μ-155μ) in width; figure 106 illustrates the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, 31μ; P-II, 81μ; P-III, 56μ; P-IV, 92μ; P-V, 46μ; figure 105 shows the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, 162μ; I-Leg-5, 163μ; I-Leg-6, 192μ; second, third and fourth legs with long swimming hairs.

Holotype: Adult ♂, from a roadside pond (a sluggish stream during the rainy season) on Highway US 441, immediately south of junction with Highway 122, Clinch County, Georgia, November 21, 1970.

Allotype: Adult ♀, same data as holotype.

Paratypes: 2 ♂♂, 1 ♀, same data as holotype.

Discussion: The present species differs from *rumulus* and *elevatus* in its well developed pair of humps on the dorsal portion of the ventral shield (fig. 100). *A. pandarus* also differs from *rumulus* in its smaller concavity behind the main hump of the cauda when viewed laterally (compare figures 98, 100). Also, the two rounded ridges at the very tip of the cauda extend closer to the midline in the present species (compare figures 103, 109).

29. Arrenurus (Megaluracarus) pilumnus, new species

(Figures 101, 104, 107)

Male: (Holotype mounted in side view, measurements are those of the paratypes); body 1413μ-1444μ in length, 729μ-760μ in width; cauda very long and narrow; greatest width of cauda 258μ-263μ; dorsal shield 478μ-486μ in width; non-cauda portion of dorsal shield bearing two pairs of glandularia, the posterior pair of which are much closer together medially; cauda lacking a median indentation at posterior end and a petiole absent; cauda with a series of dorsally directed humps, the proportions of which are best seen in lateral view (fig. 101); the more anterior of these humps no higher than one of the posterior humps; dorsal furrow passing ventrally at base of cauda; dorsal furrow incomplete, ending blindly on each side well posterior to the acetabular plates; cauda abruptly set off from the remainder of the body and slightly narrowed at this point; anterior end of body projecting and very slightly concave between the eyes; a pair of low, rounded humps present laterally on dorsal portion of ventral shield; acetabular plates extending slightly up sides of body; dorsal lengths of the palpal segments: P-I, 31μ; P-II, 76μ; P-III, 55μ; P-IV, 92μ; P-V, 44μ; figure 104 shows the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 318μ; IV-Leg-5, 222μ; IV-Leg-6, 259μ; distal end of IV-Leg-4 extending well beyond the insertion of the fifth segment; third and fourth legs with many swimming hairs; sixth segments of first and second legs with numerous short "swimming hairs".

Female: Not known with certainty.

Holotype: Adult ♂, collected in a backwater area of the Santa Fe River, on Highway US 301 at county line, Alachua County, Florida, April 16, 1950.

Paratypes: 2 ♂♂, same data as holotype.

Discussion: The present species most closely resembles *A. longicaudatus* Marshall and *A. semicircularis* Piersig, both known from more northerly areas of North America. *A. pilumnus* differs from *longicaudatus* in that the two major humps of the cauda are much closer together in the latter and there is no petiole in the new species. *A. pilumnus* differs from *semicircularis* in having a much narrower cauda and the anterior hump of the cauda is much higher in the new species.

30. Arrenurus (Megaluracarus) odatus, new species

(Figures 108, 110, 112-114)

Male: Body 1262μ (1248μ-1309μ) in length, 672μ (672μ-714μ) in width; cauda long and narrow; greatest width of cauda 308μ (308μ-327μ); dorsal shield 440μ (426μ-440μ) in width; non-cauda portion of dorsal shield bearing two pairs of glandularia, these very close together on their respective sides; cauda widest near middle; cauda with a slight median indentation posteriorly but lacking a petiole; cauda with a low rounded hump anteriorly, this best seen in lateral view; dorsal furrow passing ventrally at base of cauda; dorsal furrow incomplete, ending blindly on each side well posterior to the acetabular plates; cauda abruptly set off from the remainder of the body, and noticeably narrowed at this point; anterior end of body distinctly projecting and not concave between the eyes; this anterior projection relatively narrow and therefore the lateral eyes are much closer together than is typical in this subgenus; body proportionally very high (fig. 110); acetabular plates extending slightly up sides of body; dorsal lengths of the palpal segments: P-I, 27μ; P-II, 73μ; P-III, 38μ; P-IV, 67μ; P-V, 34; palp stocky, with P-II noticeably longer and thicker than P-IV; figure 114 shows the structure of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 292μ; IV-Leg-5, 218μ; IV-Leg-6, 266μ; distal end of IV-Leg-4 extending well beyond insertion of the fifth segment; third and fourth legs with many swimming hairs.

Female: Body 1186μ (1186μ-1202μ) in length, 1003μ (987μ-1003μ) in width; anterior end of body projecting and as described for the male (fig. 113); ventral shield somewhat angular but without distinct humps; dorsal shield bearing three pairs of glandularia, the posterior two pairs of which lie on small humps; dorsal furrow complete; dorsal shield 790μ (760μ-790μ) in length, 684μ (654μ-698μ) in width; acetabular plate region 631μ (593μ-638μ) in width; gonopore 163μ (148μ-163μ) in width; figure 112 illustrates the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, 31μ; P-II, 76μ; P-III, 40μ; P-IV, 69μ; P-V, 37μ; proportions and structure of palp as illustrated and described for the male; dorsal lengths of the distal segments of the first seg: I-Leg-4, 129μ; I-Leg-5, 155μ; I-Leg-6, 163μ; third and fourth legs with many, second leg with a few swimming hairs.

Holotype: Adult ♂, collected in a borrow pit beside Highway 2 (approximately 11 miles east of the Columbia County line), Baker County, Florida, November 21, 1970.

Allotype: Adult ♀, same data as holotype.

Paratypes: 2 ♂♂, 2 ♀♀, same data as holotype; 1 ♂, from a small pond in Pinellas County, Florida, April 10, 1950.

Discussion: The new species seems most closely related to *A. scutuliformis* Marshall and *A. pseudoconicus* Piersig. It differs most noticeably (in both sexes) in its much higher body and relatively narrow anterior projection of the body in which the lateral eyes are placed close together.

31. Arrenurus (Megaluracarus) nasus, new species

(Figures 115-117)

Male: Body 1170µ (1170µ-1246µ) in length, 608µ (608µ-653µ) in width; cauda long and narrow; greatest width of cauda 264µ (264µ-288µ); dorsal shield 395µ 380µ-403µ) in width; non-cauda portion of dorsal shield bearing two pairs of glandularia, the posterior pair of which are much closer together medially; cauda widest near middle; cauda with a slight median notch and bearing a small peg-like petiole at extreme posterior end (fig. 117); cauda with a very low dorsal hump (fig. 116); dorsal furrow passing ventrally at base of cauda; dorsal furrow incomplete, ending blindly on each side well posterior to the acetabular plates; cauda abruptly set off from the remainder of the body and slightly narrowed at this point; anterior end decidedly projecting and ending in a rounded point (figs. 116, 117); a pair of well developed humps present laterally on dorsal portion of ventral shield; acetabular plates extending slightly up sides of body; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 281µ; IV-Leg-5, 189µ; IV-Leg-6, 200µ; distal end of IV-Leg-4 extending well beyond insertion of fifth segment; third and fourth legs with many swimming hairs.

Female: Unknown.

Holotype: Adult ♂, collected in a roadside pond (a sluggish stream during the rainy season) on Highway US 441, immediately south of junction with Highway 122, Clinch County, Georgia, November 21, 1970.

Paratypes: 3 ♂♂, from a water filled roadside ditch beside Highway US 441 six miles north of McIntyre, Wilkinson County, Georgia, September 11, 1968.

Discussion: The new species is related to a species group which includes *paralleatus* Marshall, *wardi* Marshall and *kinkaidi* Lavers. *A. nasus* differs most noticeably for the latter three species in its projecting, bluntly pointed anterior end. In the other three species, the anterior end is truncate or slightly concave between the eyes.

32. Arrenurus (Megaluracarus) nedymus, new species

(Figures 118, 121, 132)

Male: Body 942µ (942µ-958µ) in length, 616µ (608µ-616µ) in width; cauda of moderate length and proportionally wide; greatest width of cauda 304µ (304µ-327µ); dorsal shield 471µ (471µ-485µ) in width; non-cauda portion of dorsal shield bearing two pairs of glandularia, these located very close together on their respective sides; cauda widest near middle; posterior end of cauda with a shallow notch, but without a petiole; posterolateral corners of cauda slightly projecting; cauda with a low, rounded hump dorsally (fig. 132); dorsal furrow passing ventrally at base of cauda; dorsal furrow complete and passing immediately posterior to the acetabular plates; cauda distinctly set off from the remainder of the body and very slightly narrowed at this point; anterior end of body projecting and concave between the eyes; a pair of rounded humps present laterally on dorsal portion of the ventral shield; acetabular plates extending slightly up sides of body; dorsal lengths of the palpal segments: P-I, 27μ; P-II, 59μ; P-III, 43μ; P-IV, 73μ; P-V, 38μ; figure 121 shows the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 218μ; IV-Leg-5, 170μ; IV-Leg-6, 170μ; distal end of IV-Leg-4 projecting well beyond insertion of the fifth segment; third and fourth legs with many swimming hairs.

Female: Unknown.

Holotype: Adult ♂, collected in a cypress pool in Pasco County, Florida, April 9, 1950.

Paratype: 1 ♂, same data as holotype.

Discussion: The new species belongs to a species group which includes *A. manubriator* Marshall (northeastern North America) and *A. capillatus* Marshall (California). It differs from both in its distinct projections at the posterolateral corners of the cauda (fig. 118), and its proportionally much higher hump on the dorsal portion of the cauda (fig. 132). It also differs from *capillatus* in its proportionally longer and narrower cauda and differs from *manubriator* in that the cauda does not become noticeably expanded at the extreme posterior end.

33. Arrenurus (Megaluracarus) optatus, new species

(Figures 119, 120, 127, 128, 130)

Male: Body 1155μ (1125μ-1155μ) in length, 644μ (638μ-644μ) in width; cauda moderately long and indistinctly set off from the remainder of the body; greatest width of cauda at base, 410μ (410μ-421μ); dorsal shield 509μ (509μ-517μ) in width; non-cauda portion of dorsal shield bearing two pairs of glandularia, the posterior pair of which are somewhat closer together medially; cauda with a slight median indentation at posterior end; a petiole absent; cauda of nearly uniform height along most of its length and about the same height as the body proper (fig. 130); dorsal furrow passing ventrally at base of cauda; dorsal furrow incomplete, ending blindly on each side well posterior to the acetabular plates; anterior end of body not noticeably projecting and convex between the eyes; acetabular plates extending slightly up sides of body; dorsal lengths of palpal segments: P-I, 36μ; P-II, 83μ; P-III, 47μ; P-IV, 95μ; P-V,. 43μ; figure 119 illustrates the structure of the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 204μ; IV-Leg-5, 214μ; IV-Leg-6, 263μ; distal end of IV-Leg-4 extending somewhat beyond the insertion of the fifth segment; third and fourth legs with many swimming hairs.

Female: Body 1125μ in length, 897μ in width; anterior end not projecting and is convex between the eyes; ventral shield oval and without projections; dorsal shield bearing three pairs of glandularia, none of which lie on humps; dorsal furrow complete; dorsal shield 942μ in length, 745μ in width; acetabular plate region 653μ in width; gonopore 144μ in width; figure 128 shows the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, 36μ; P-II, 80μ; P-III, 52μ; P-IV, 90μ; P-V, 47μ; palp similar to that illustrated for the male; dorsal lengths of the distal segments of the first leg: I-Leg-4, 148μ; I-Leg-5, 163μ; I-Leg-6, 163μ; third and fourth legs with many, second leg with a few swimming hairs.

Holotype: Adult ♂, from a small cold brook in thick woods, Hubbard County, Minnesota, June 24, 1954.

Allotype: Adult ♀, same data as holotype.

Paratypes: 1 ♂, same data as holotype.

Discussion: The new species is not closely related to any previously described species. It is very different in that the male cauda is widest at base (and increasingly narrowed posteriorly) and the body is of almost uniform height along the entire length except for extreme posterior end (fig. 130).

34. Arrenurus (Megaluracarus) opiparus, new species

(Figures 122, 123, 129)

Male: Body 1551μ in length, 820μ in width; cauda long and relatively narrow; greatest width of cauda 410μ; dorsal shield 608μ in width; non-cauda portion of dorsal shield bearing two pairs of glandularia, the posterior pair of which are somewhat closer together medially; cauda widest near middle; cauda without a median cleft, but end bears a pair of small flap-like structures which extend beyond the posterior end and there is a small, pointed petiole which extends dorsally (figs. 123, 129); dorsal furrow passing ventrally at base of cauda; dorsal furrow incomplete, ending blindly on each side well posterior to the acetabular plates; cauda distinctly set off from the remainder of the body and somewhat narrowed at this point; anterior end of body slightly projecting but not concave between the eyes; acetabular plates extending slightly up sides of body; dorsal lengths of the palpal segments: P-I, 44μ; P-II, 111μ; P-III, 74μ; P-IV, 126μ; P-V, 59μ; medial surface of P-II with several thickened setae; figure 122 illustrates the palp; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 377μ; IV-Leg-5, 259μ; IV-Leg-6, 340μ; distal end of IV-Leg-4 extending well beyond proximal end of the fifth segment; third and fourth legs with many, second leg with a few swimming hairs.

Female: Unknown.

Holotype: Newly metamorphosed ♂, taken in a small pond beside Highway US 6 approximately one mile north of Wheeler, Summit County, Colorado, July 31, 1954.

Discussion: The new species seems most closely related to the European species, *A. zachariae* Koenike and *A. membranator* Thor. The North American species differs from *membranator* in lacking pointed projections at the posterolateral corners of the cauda. *A. opiparus* seems most closely related to *zachariae* but differs most noticeably in that the male cauda of the North American species is more or less truncate. The posterior end of the cauda is somewhat roundly pointed in the European species.

35. Arrenurus (Megaluracarus) melemus, new species

(Figures 124-126, 131, 133)

Male: Body 1763μ (1611μ-1763μ) in length, 896μ (881μ-896μ) in width; cauda long and narrow; greatest width of cauda 441 (428μ-455μ); dorsal shield 623μ (562μ-623μ) in width; non-cauda portion of dorsal shield bearing two pairs of glandularia, the posterior pair of which are much closer together medially;

cauda only slightly wider in middle than at base; posterior end of cauda with a median indentation but lacking a petiole; posterolateral corners of cauda with small projections; cauda, when viewed laterally, with a well developed hump posteriorly (fig. 124); dorsal furrow passing ventrally at base of cauda; dorsal furrow incomplete and ending blindly on each side well posterior to the acetabular plates; cauda abruptly set off from the remainder of the body and somewhat narrowed at this point; anterior end of body projecting and not concave between the eyes; acetabular plates extending slightly up sides of body; dorsal lengths of the palpal segments: P-I, 52μ; P-II, 133μ; P-III, 96μ; P-IV, 178μ; P-V, 77μ; first three palpal segments narrow, fourth segment expanded distally; structure of palp similar to that of the female; capitulum with long capitular apodemes and the pharynx is prominent; dorsal lengths of the distal segments of the fourth leg: IV-Leg-4 (including distal projection), 281μ; IV-Leg-5, 325μ; IV-Leg-6, 340μ; distal end of IV-Leg-4 extending well beyond the proximal end of the fifth segment; third and fourth legs with many, second leg with a few swimming hairs.

Female: Body 1337μ in length, 1079μ in width; anterior end of body projecting as in male (fig. 125); ventral shield more or less oval and without humps; dorsal shield bearing three pairs of glandularia, none of which lie on humps; dorsal furrow complete; dorsal shield 912μ in length, 821μ in width; acetabular plate region 669μ in width; gonopore 228μ in width; postgenital sclerite region distinctly raised and set off from the body; capitular bay shallow; figure 126 shows the structure of the ventral shield; dorsal lengths of the palpal segments: P-I, 61μ; P-II, 129μ; P-III, 85μ; P-IV, 179μ; P-V, 89μ; figure 133 shows the proportions and chaetotaxy of the palp; dorsal lengths of the distal segments of the first leg: I-Leg-4, 227μ; I-Leg-5, 252μ; I-Leg-6, 215μ; swimming hairs as described for the male.

Holotype: Adult ♂, collected in a roadside pond (a sluggish stream during the rainy season) on Highway US 441, immediately south of junction with Highway 122, Clinch County, Georgia, November 21, 1970.

Allotype: Adult ♀, same data as holotype.

Paratypes: 3 ♂♂, from a borrow pit beside Highway 2 (approximately 11 miles east of the Columbia County line), Baker County, Florida, November 21, 1970; 8 ♂♂, 3 ♀♀, from a lake near Mill Dam in Ocala National Forest, Marion County, Florida, November 19, 1970; 2 ♂♂, from a roadside pool five miles west of Grower s Corners, Pasco County, Florida, April 9, 1950; 3 ♂♂, from a pond in Hillsborough County, Florida, April 11, 1950.

Discussion: The new species is most closely related to *Arrenurus pseudocylindratus* Piersig. *A. melemus* is much larger, the male cauda is proportionally narrower and the body is proportionally much higher. The postgenital sclerite region in females of the present species is also much more prominent.

LIST OF PREVIOUSLY DESCRIBED SPECIES KNOWN FROM FLORIDA

Since the water mite fauna of Florida is poorly known, it seems desirable to include a list of previously described arrenuri which are known to occur there. The counties in which the species were taken are included in parentheses following the species name: *A. acutus* Marshall (Columbia, Citrus, Dade); *A. apetiolatus* Piersig (Holmes, Lafayette, Pasco, Pinellas, Citrus, Sarasota, Charlotte, Polk, Baker, Dade, Collier, Broward); *A. birgei* Marshall (Manatee, Collier); *A. cardiacus* Marshall (Columbia); *A. expansus* Marshall (Taylor, Citrus, Collier); *A. flabellifer* Marshall (Sarasota, Pasco, Collier); *A. magnicaudatus* Marshall (Sarasota, Dade); *A. marshallae* Piersig (Taylor, Lafayette, Citrus, Pinellas, Sarasota, Dade); *A. megalurus* Marshall (Highlands, Pasco); *A. neobirgei* Cook (Taylor); *A. platyrotundocuspidator* Münchberg (Escambia, Holmes, Washington); *A. pleopetiolatus* Marshall (Marion); *A. pseudotenuicollis* Wilson (Sarasota, Charlotte, Collier, Dade, Broward); *A. uniprojectus* Wilson (Holmes).

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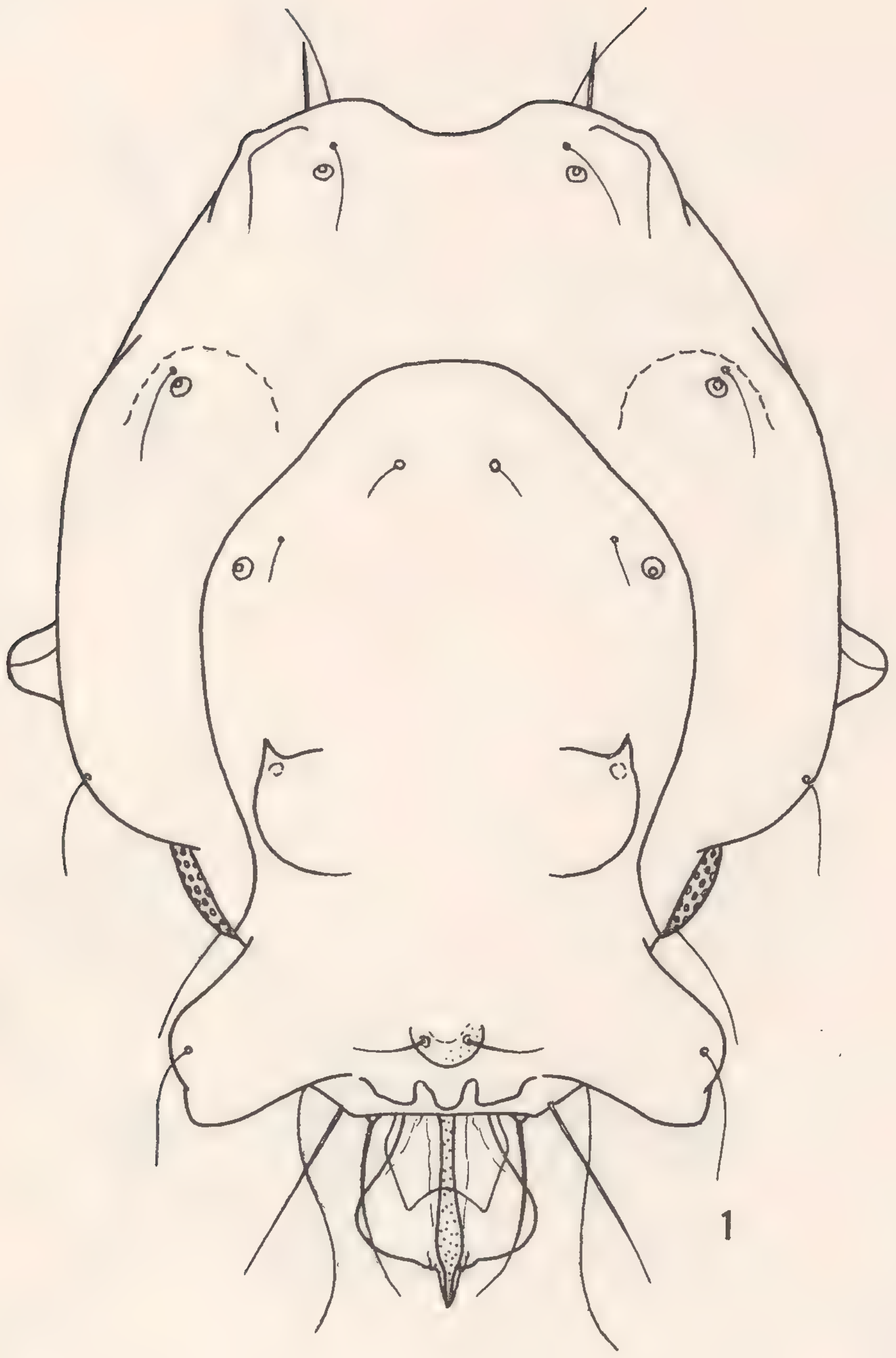

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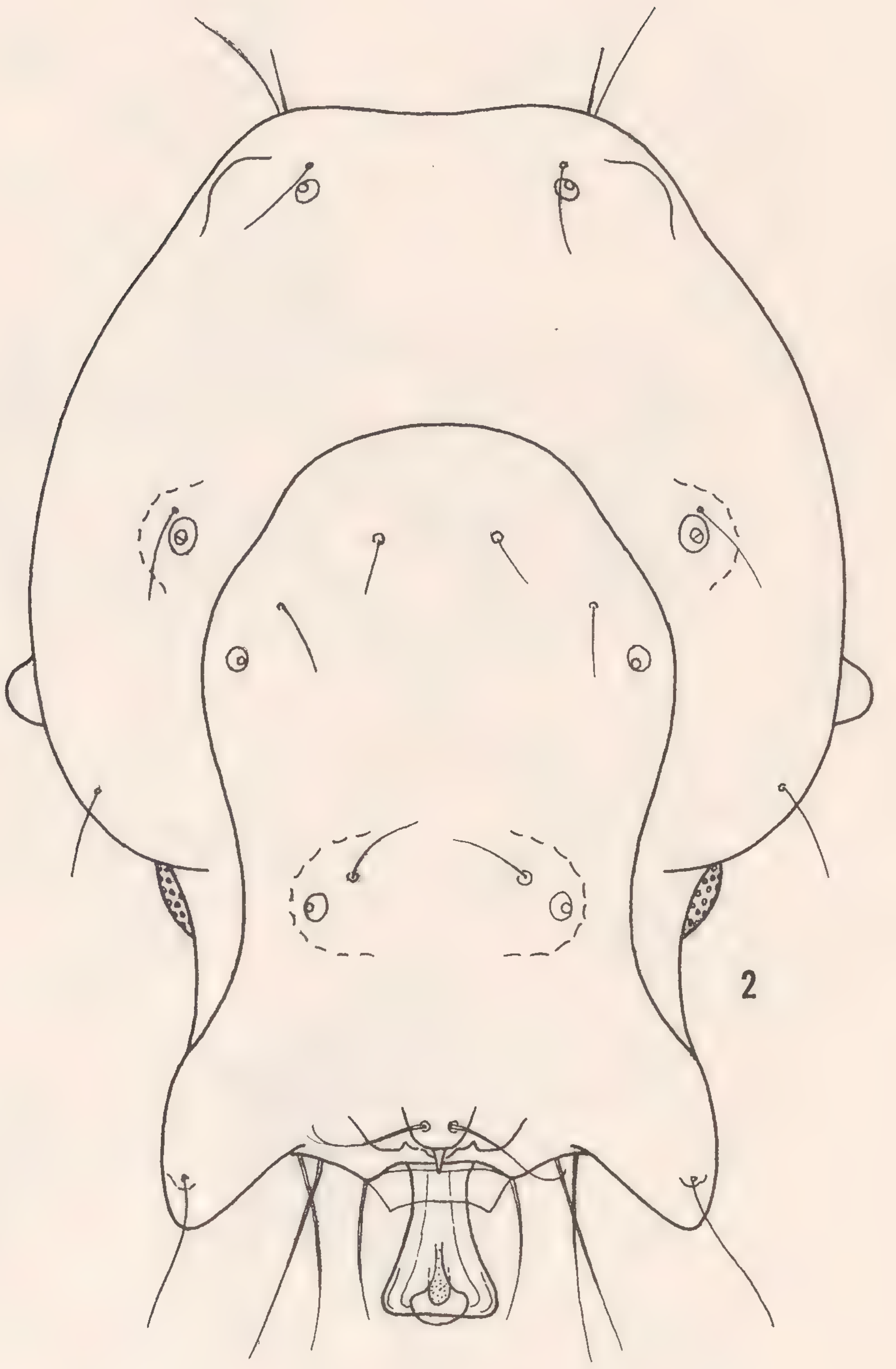

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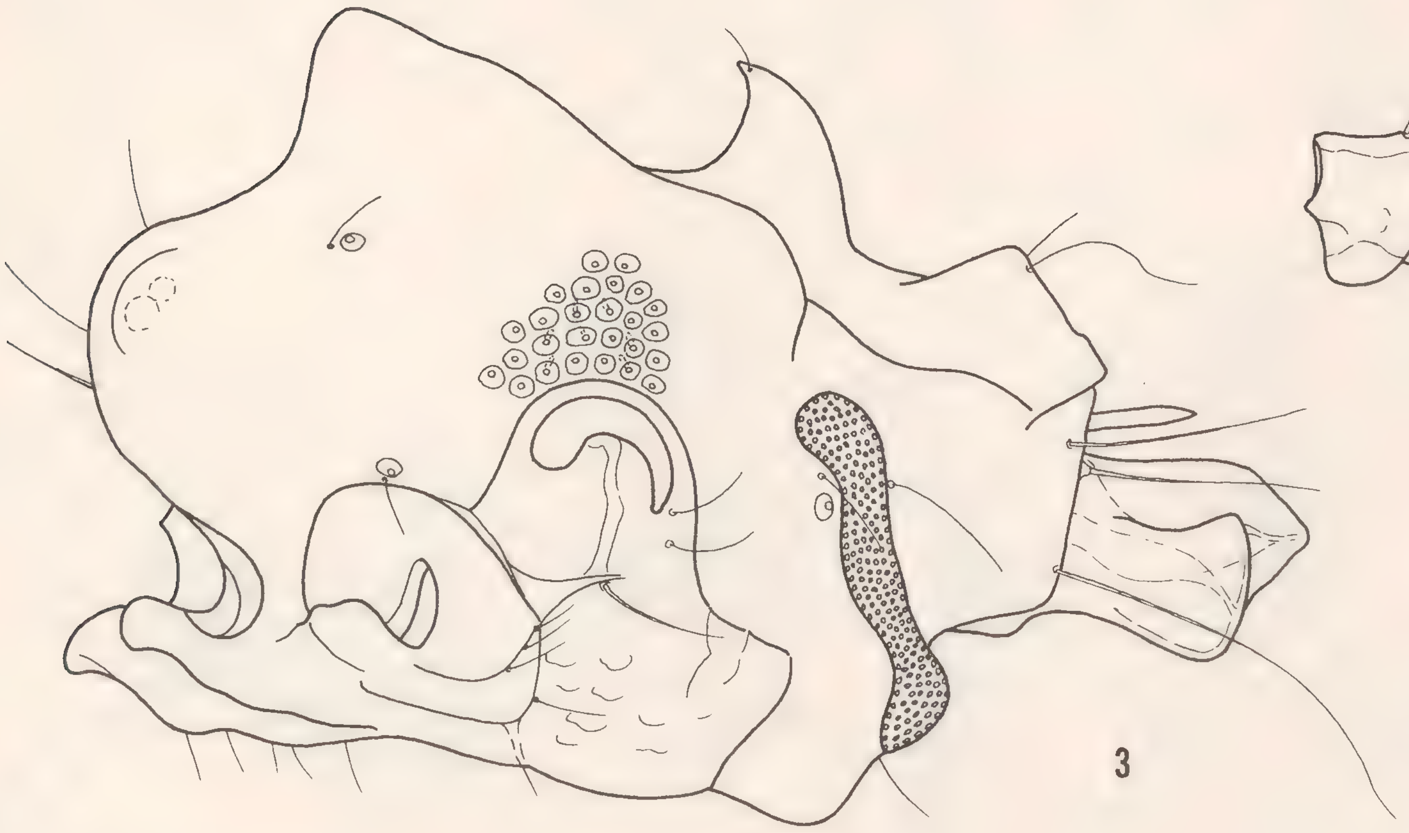

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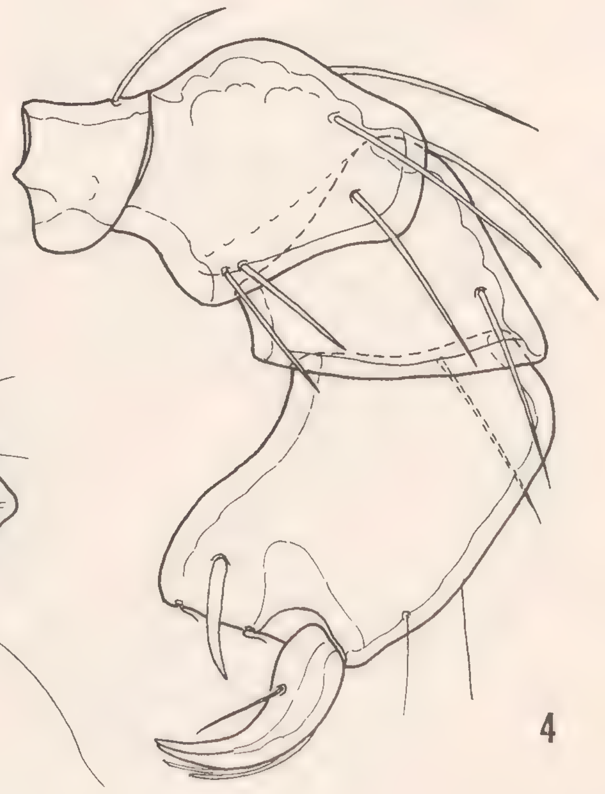

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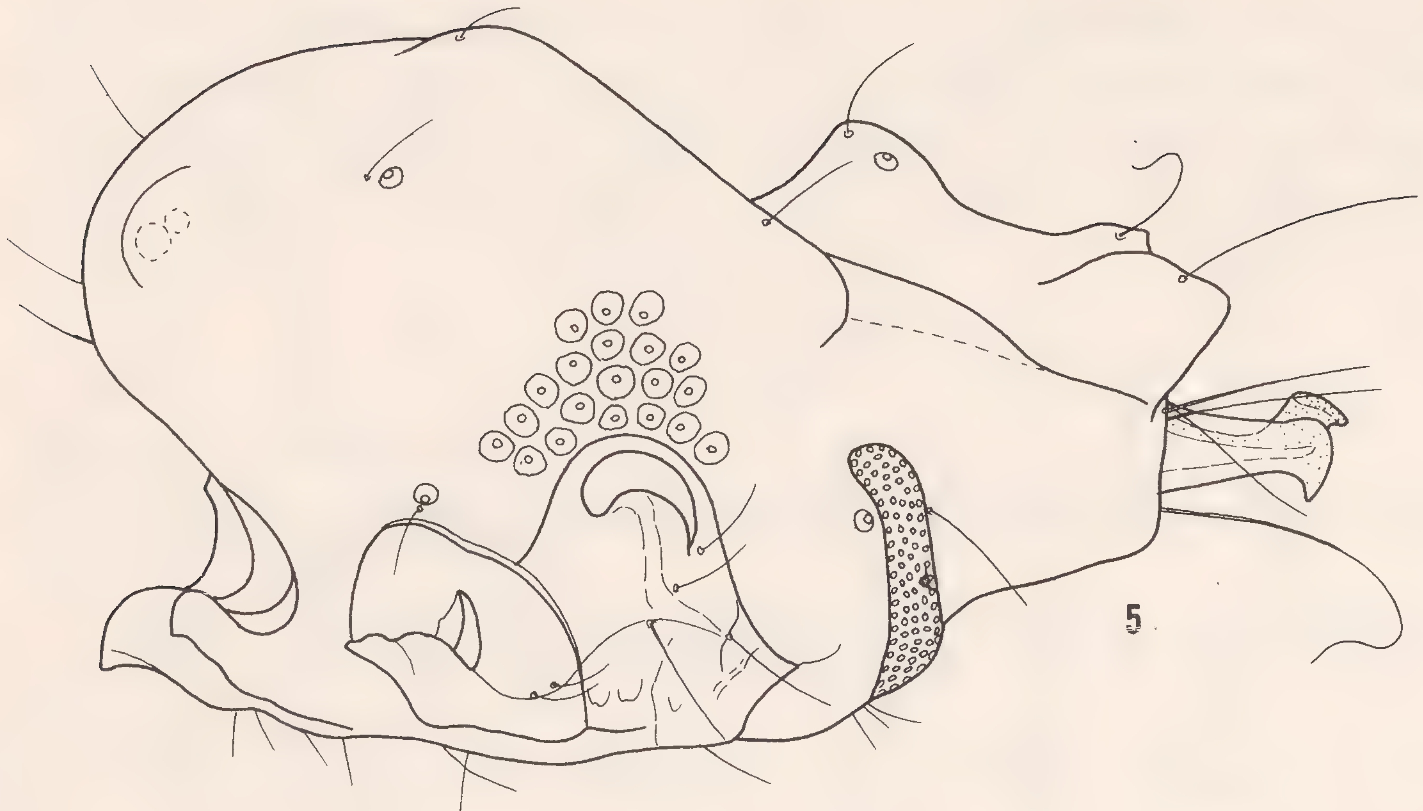
Arrenurus arguticornis n. sp. Fig. 1, dorsal view, ♂; Fig. 3, lateral view, ♂; Fig. 4, palp, ♂.
Arrenurus manateensis n. sp. Fig. 2, dorsal view, ♂.



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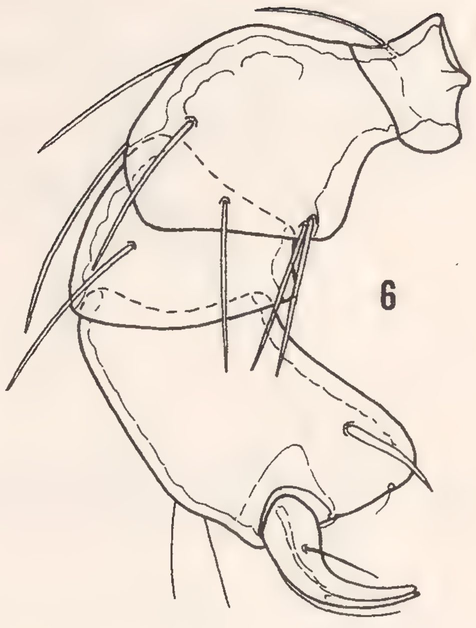

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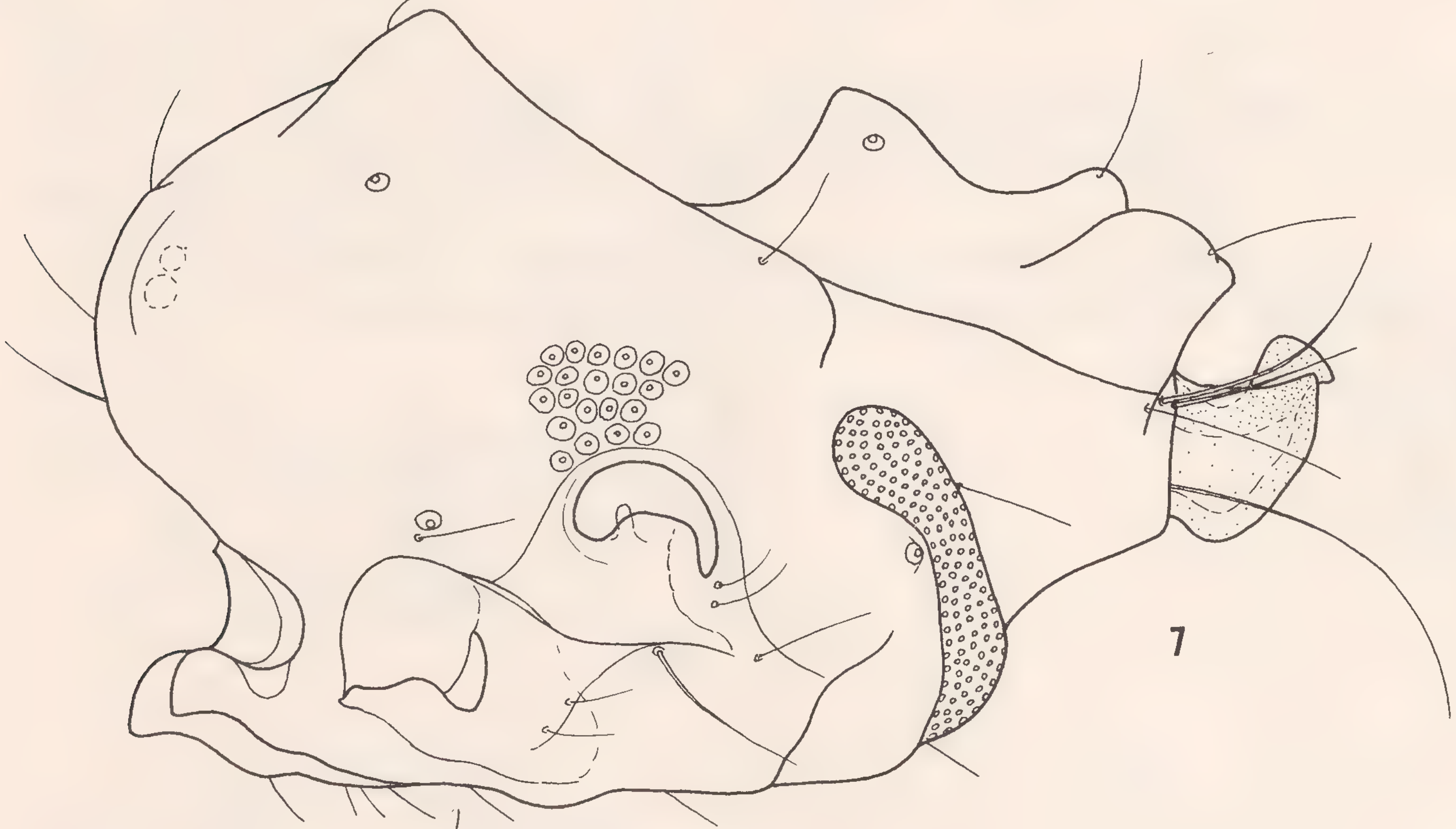

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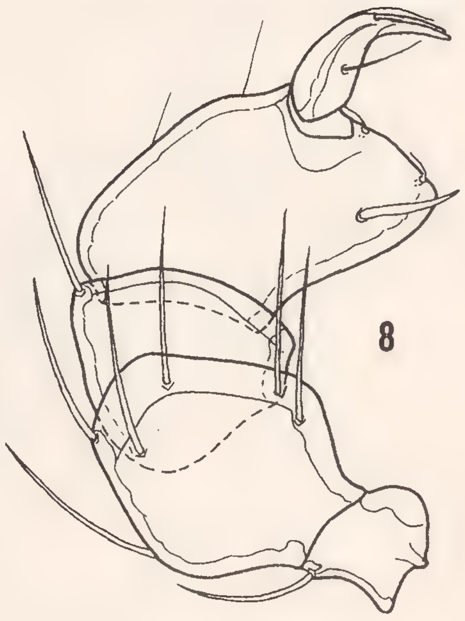

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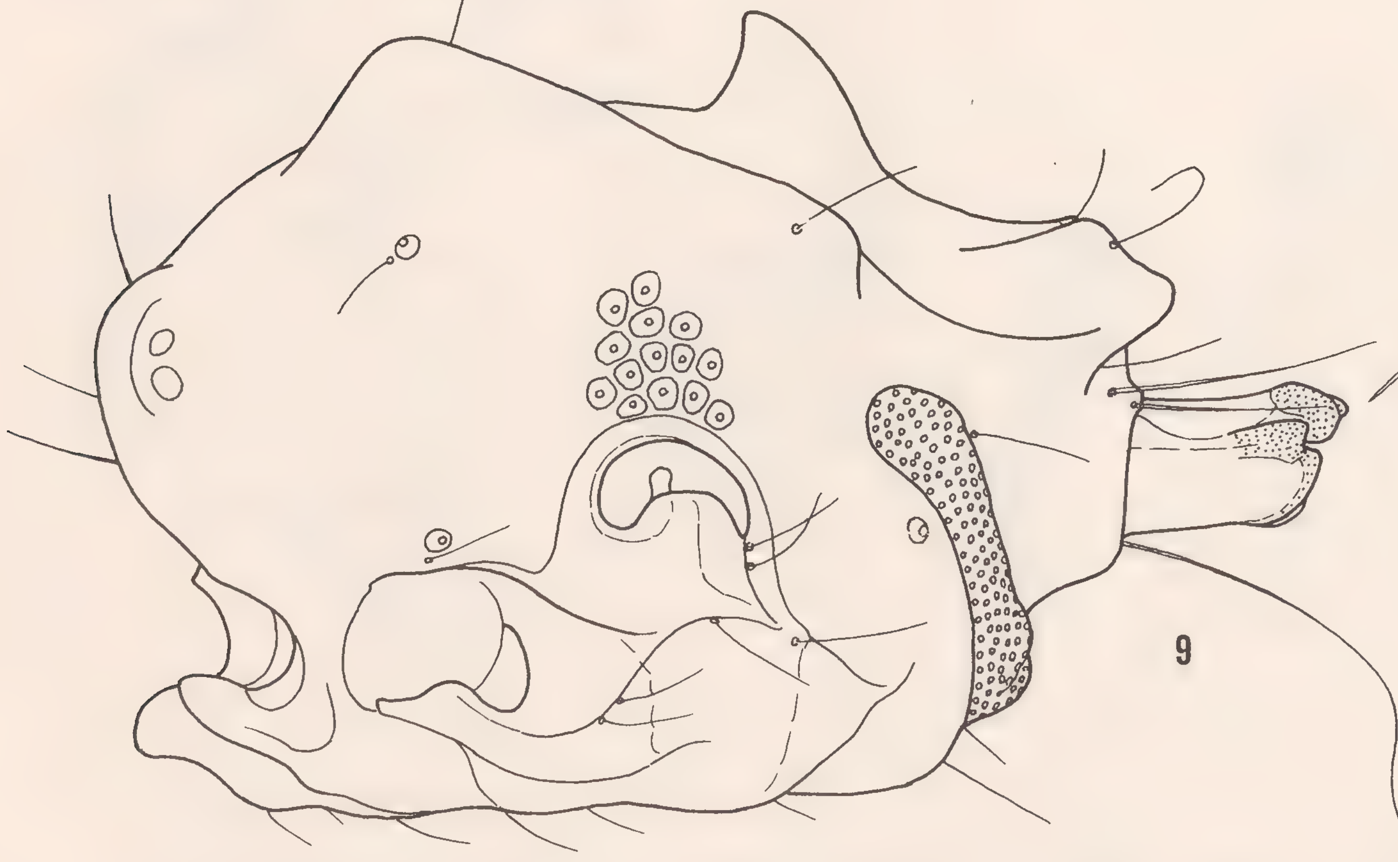

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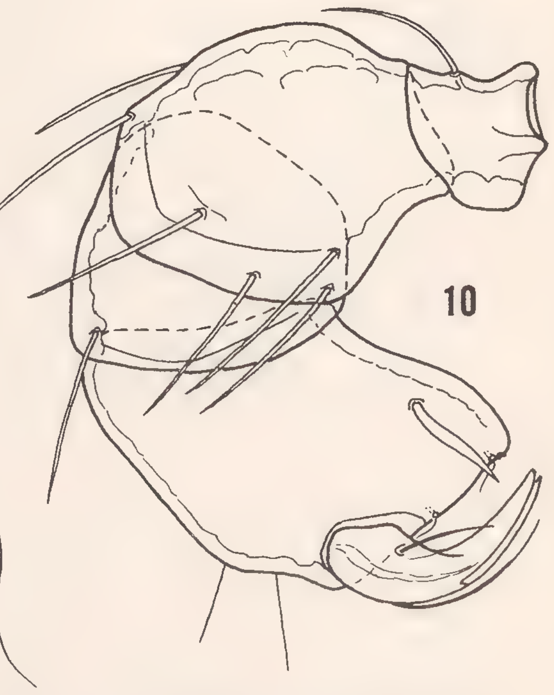
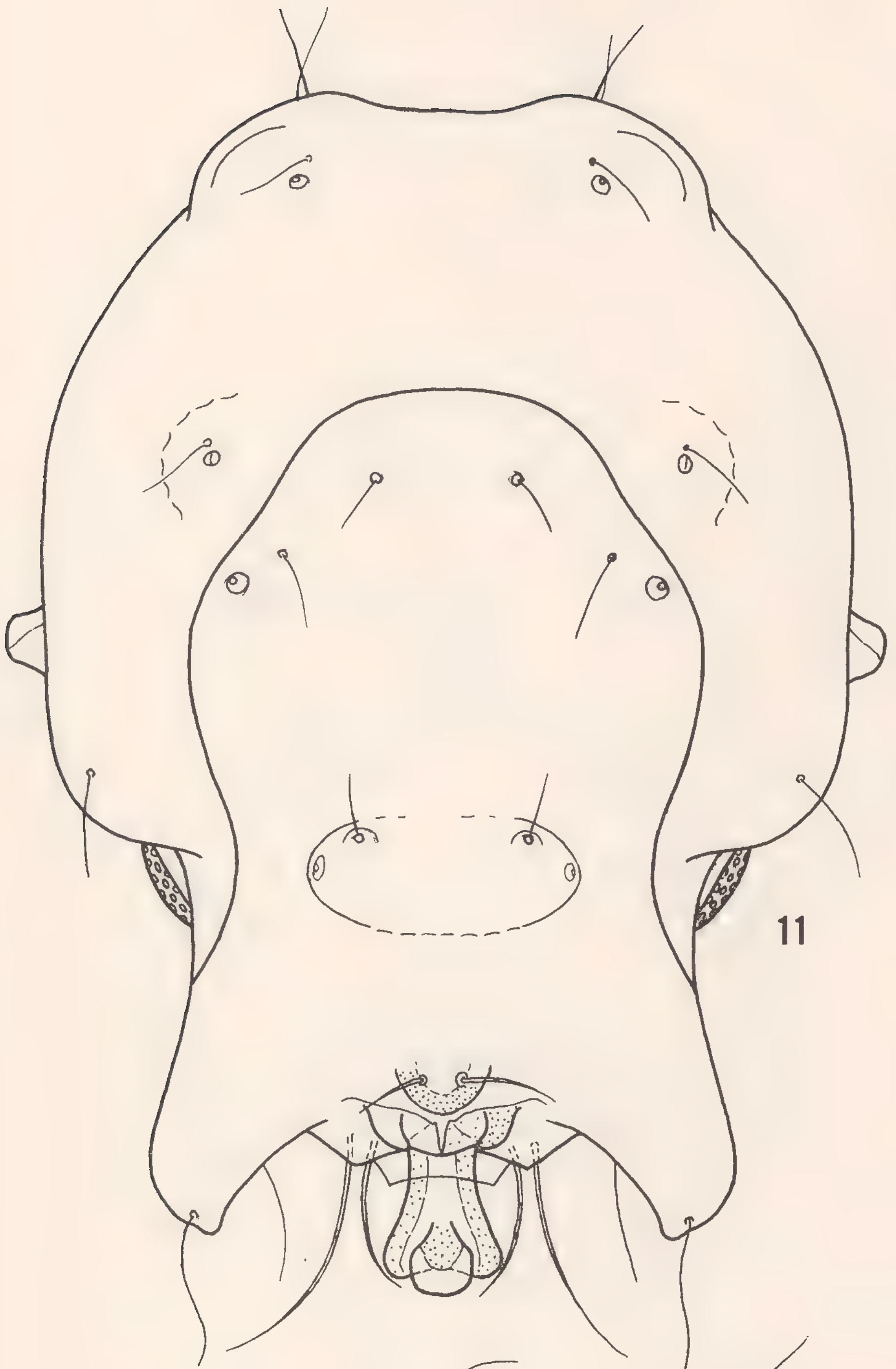


10

Arrenurus manateensis n. sp. Fig. 5, lateral view, ♂; Fig. 6, palp, ♂.
Arrenurus newelli n. sp. Fig. 7, lateral view, ♂; Fig. 8, palp, ♂.
Arrenurus marionensis n. sp. Fig. 9, lateral view, ♂; Fig. 10, palp, ♂.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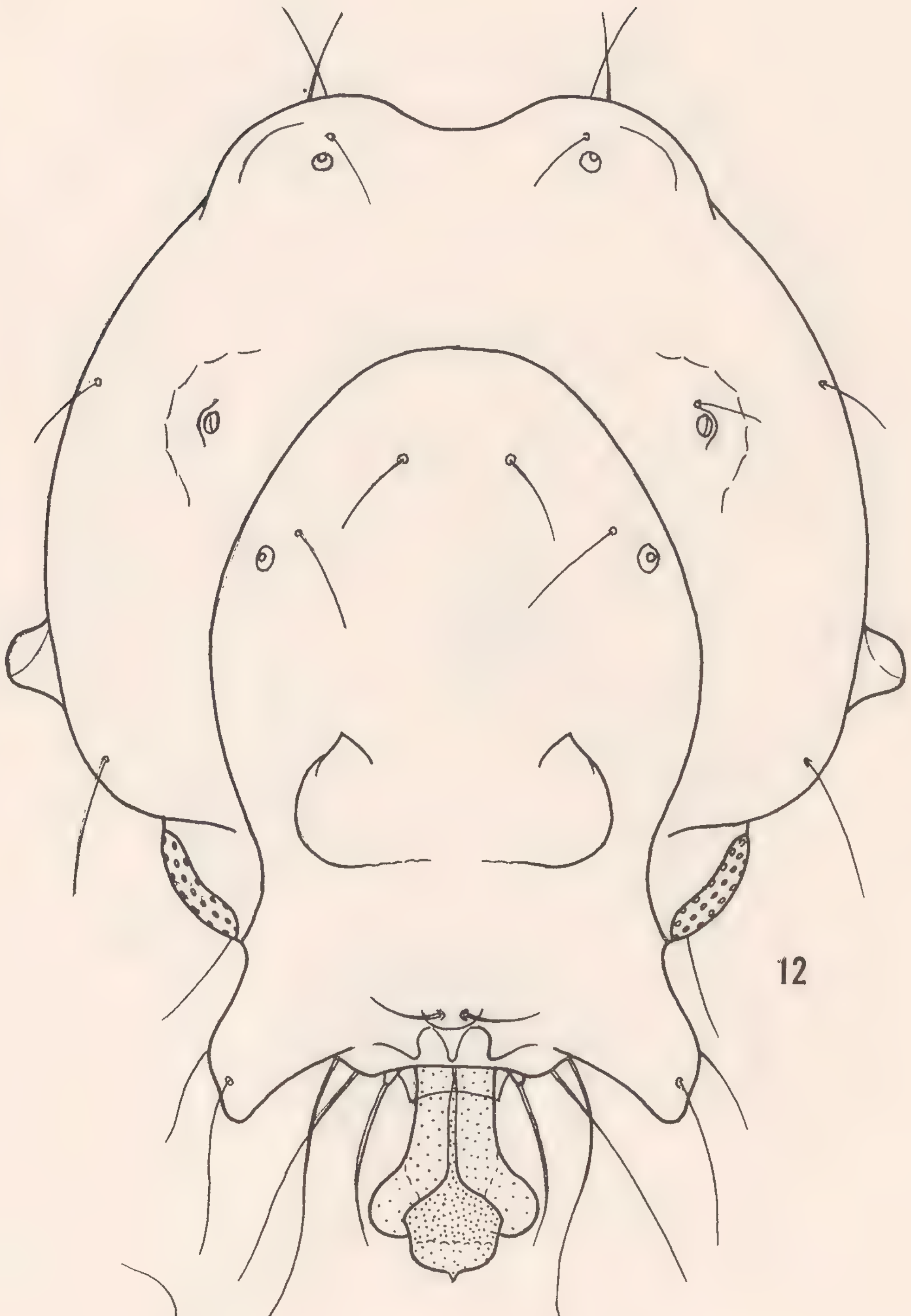
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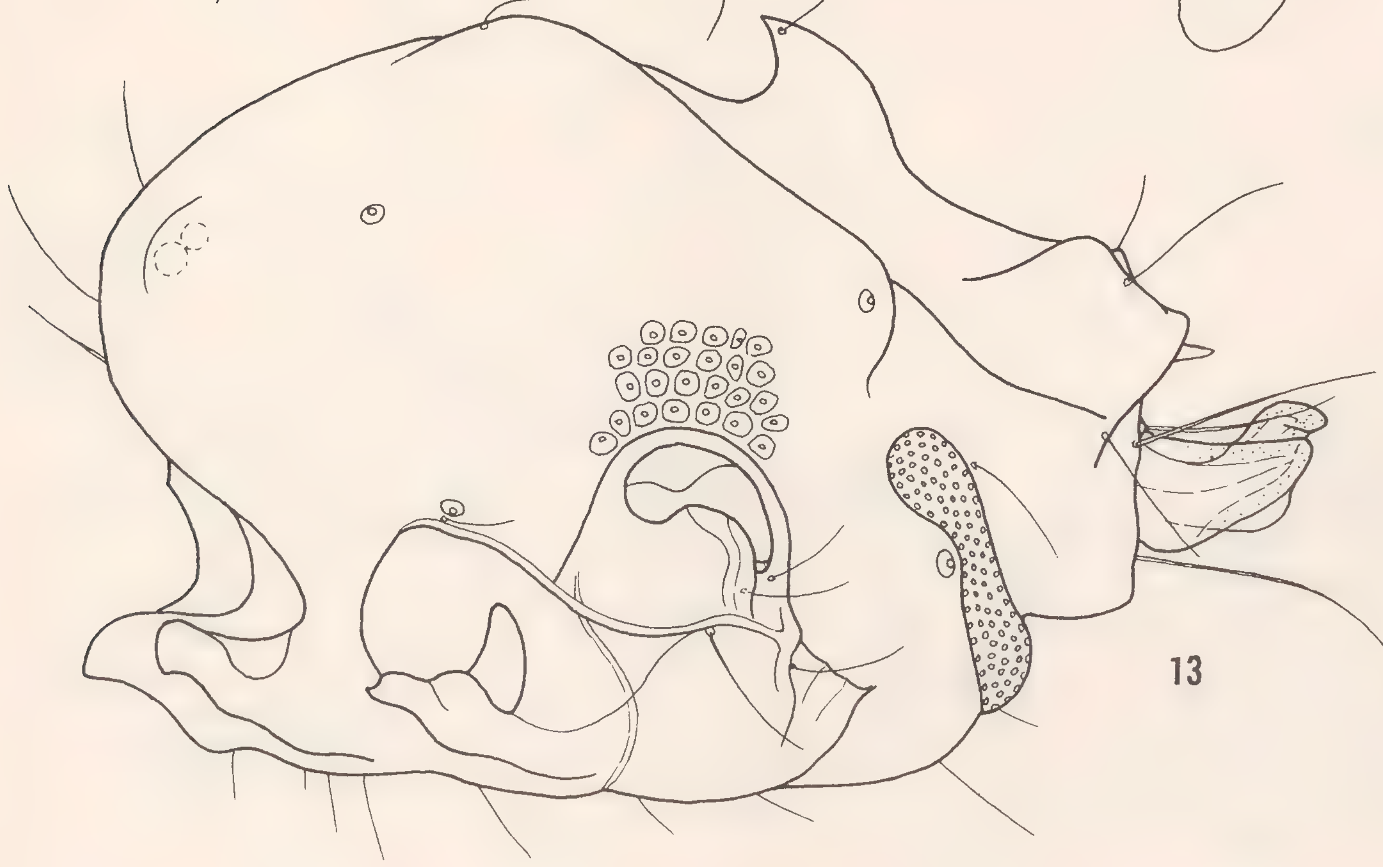
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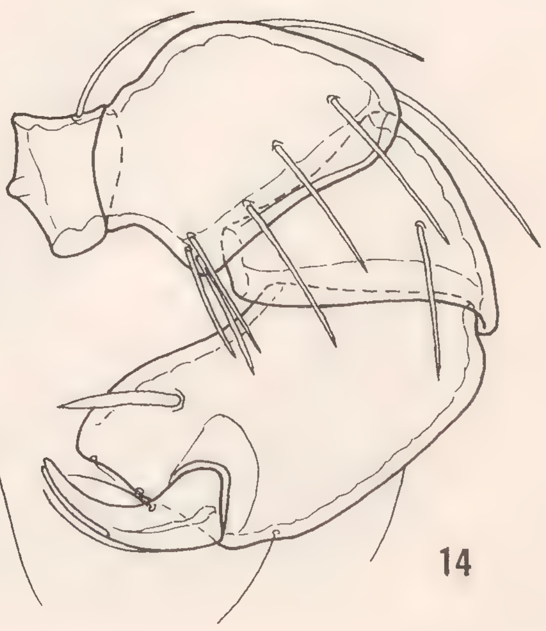
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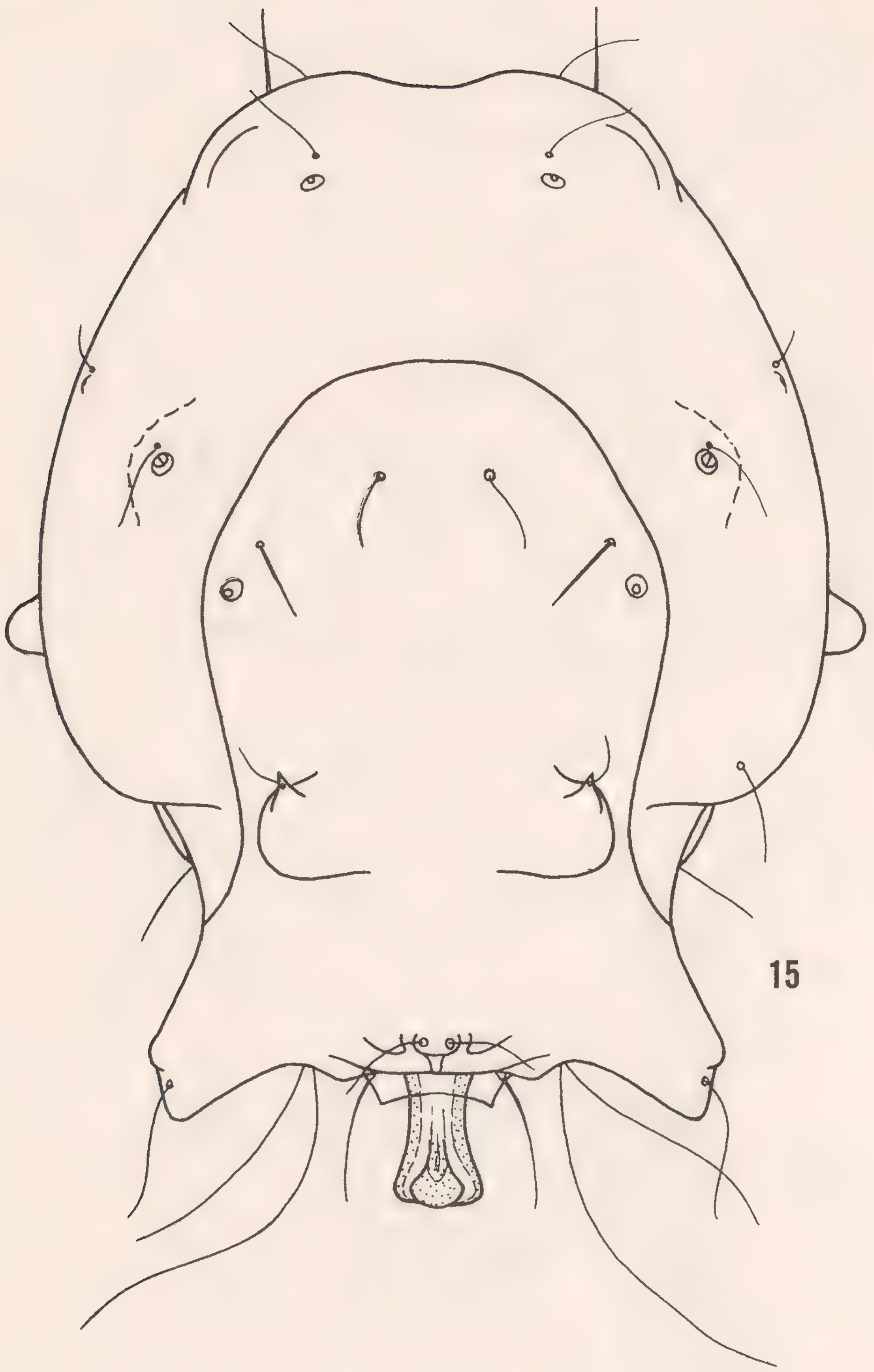
Arrenurus newelli n. sp. Fig. 11, dorsal view, ♂.
Arrenurus marionensis n. sp. Fig. 12, dorsal view, ♂.
Arrenurus apopkensus n. sp. Fig. 13, lateral view, ♂; Fig. 14, palp, ♂.



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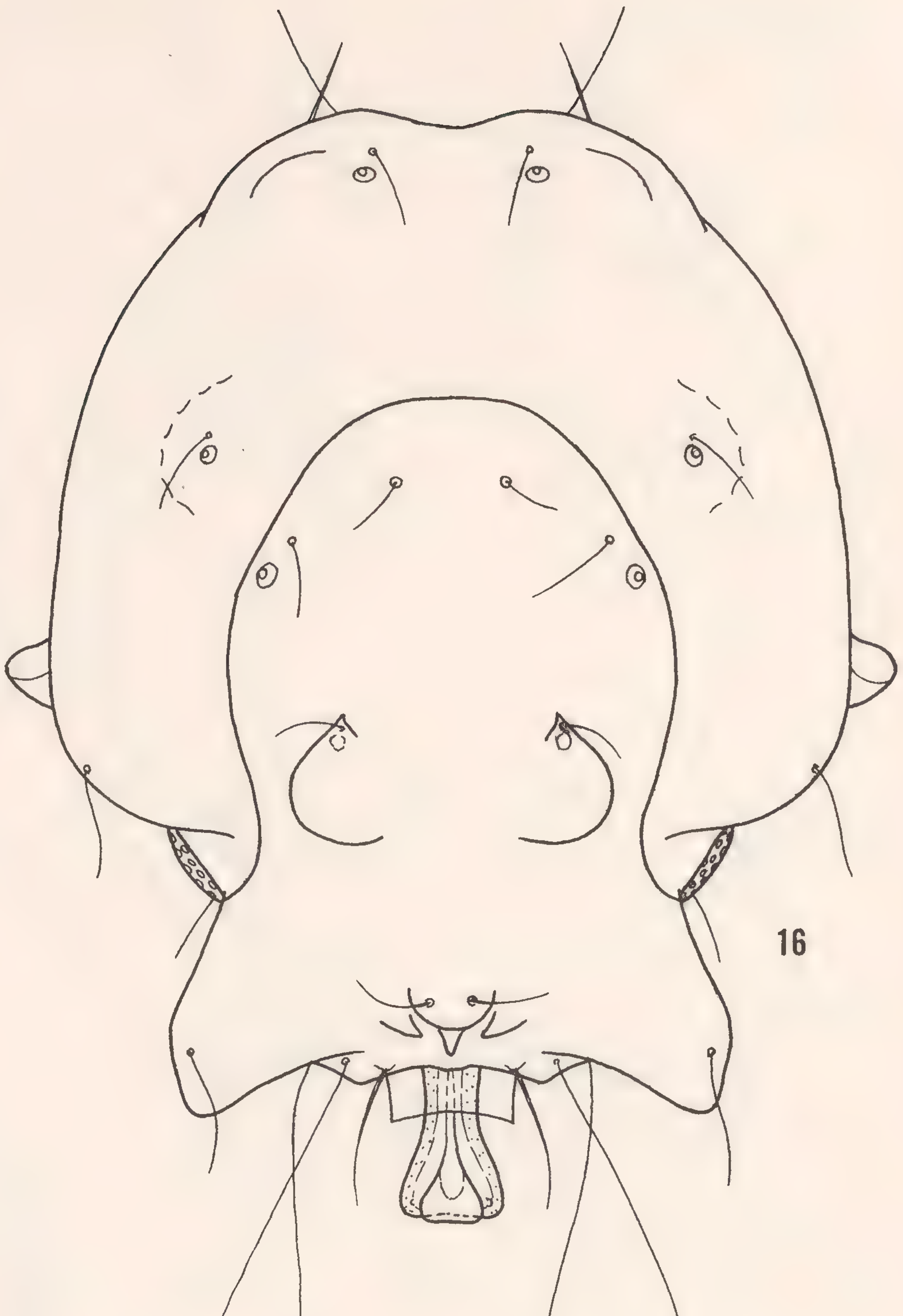

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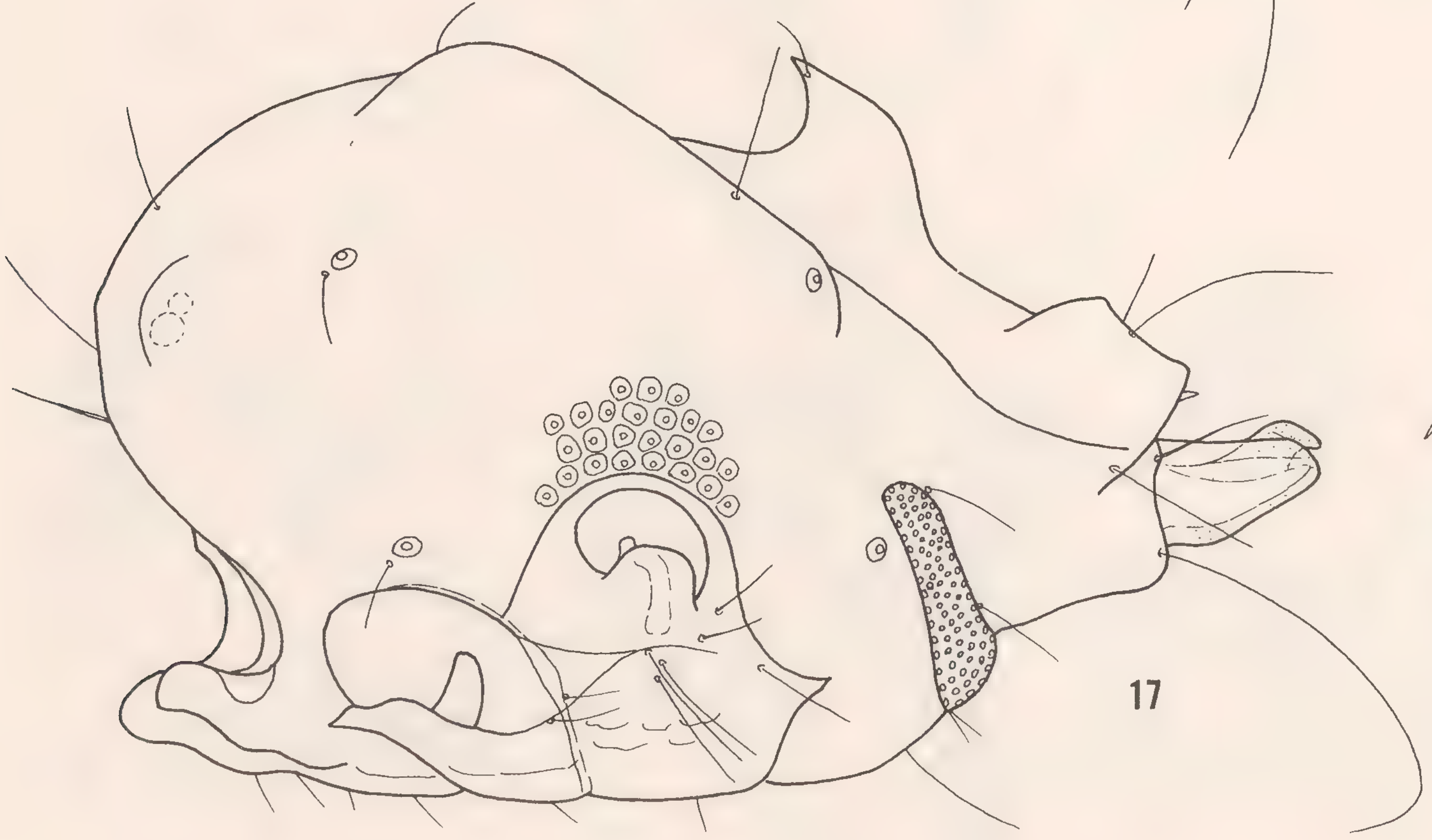

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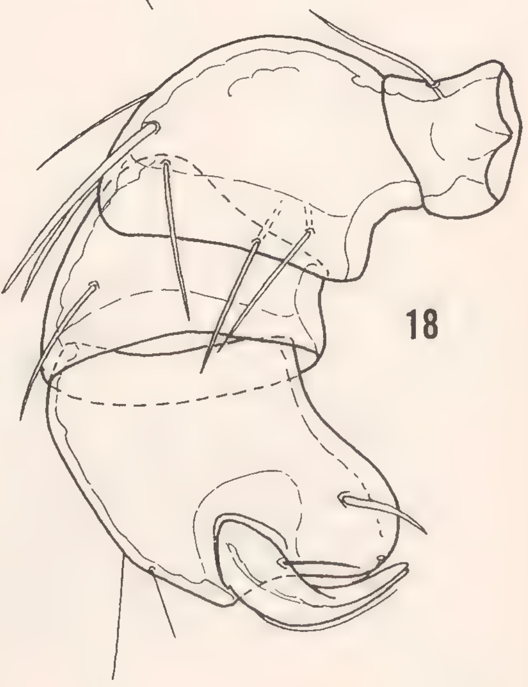

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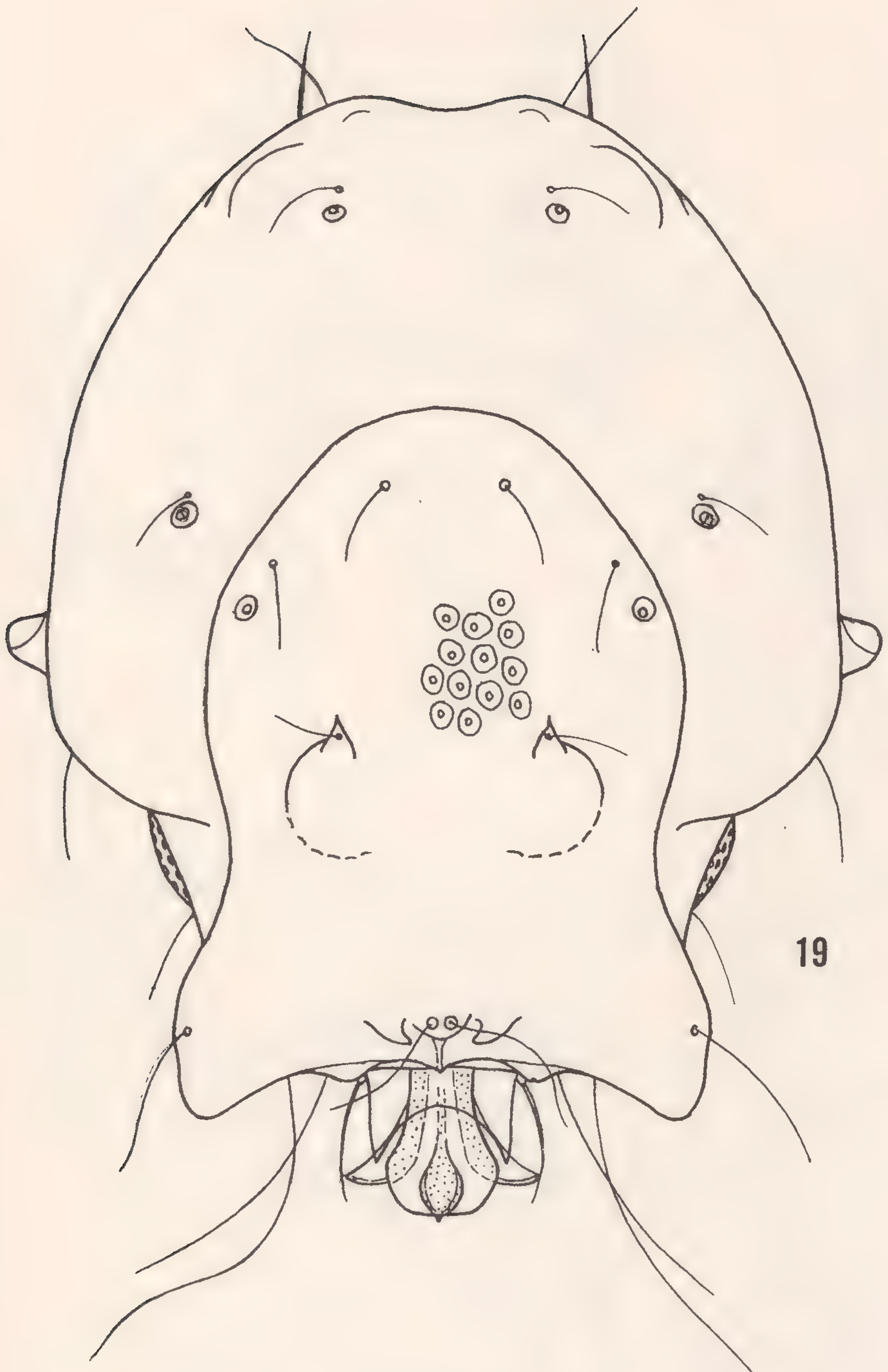
Arrenurus zeugicornis n. sp. Fig. 15, dorsal view, ♂; Fig. 17, lateral view, ♂; Fig. 18, palp, ♂.
Arrenurus apopkensus n. sp. Fig. 16, dorsal view, ♂.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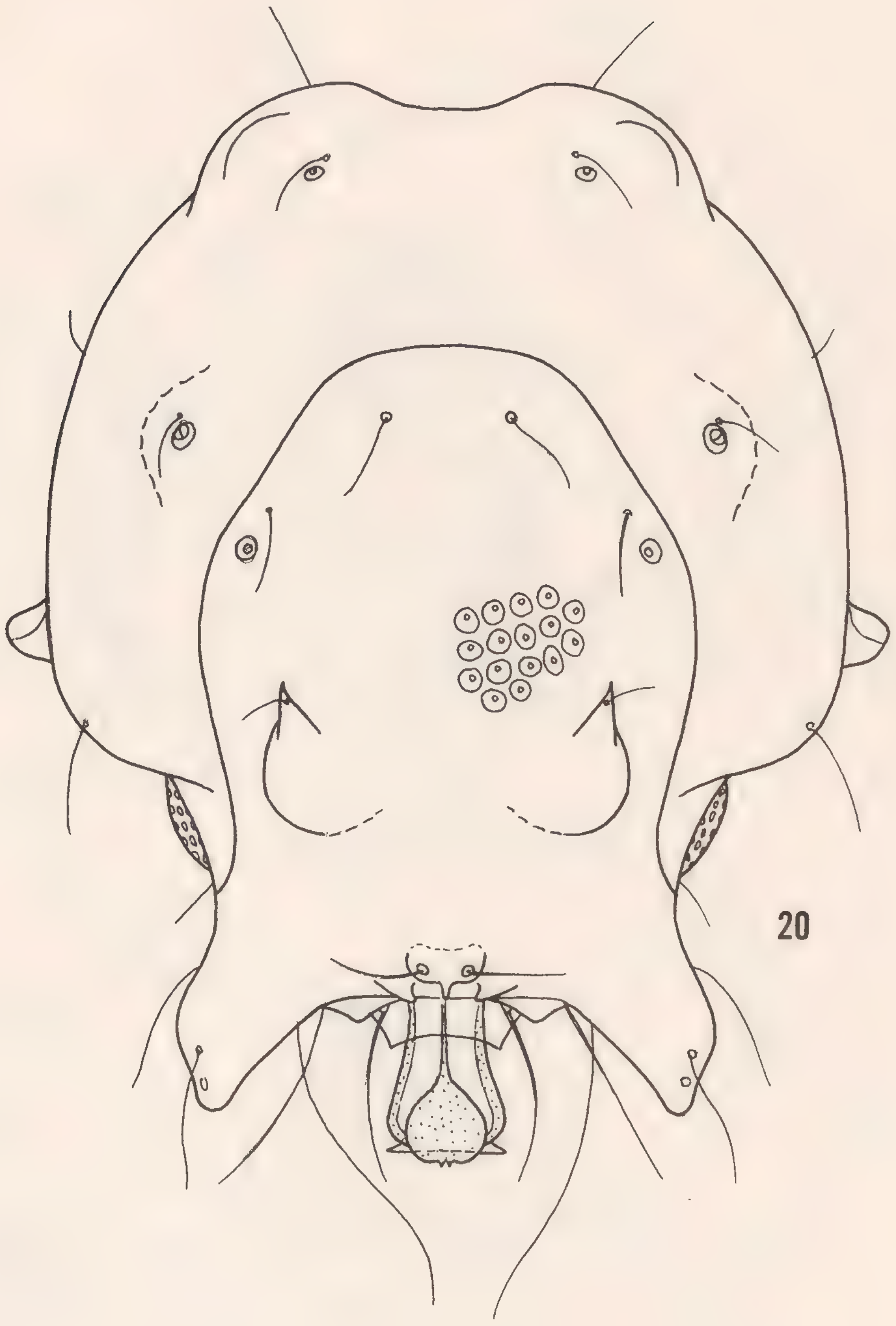
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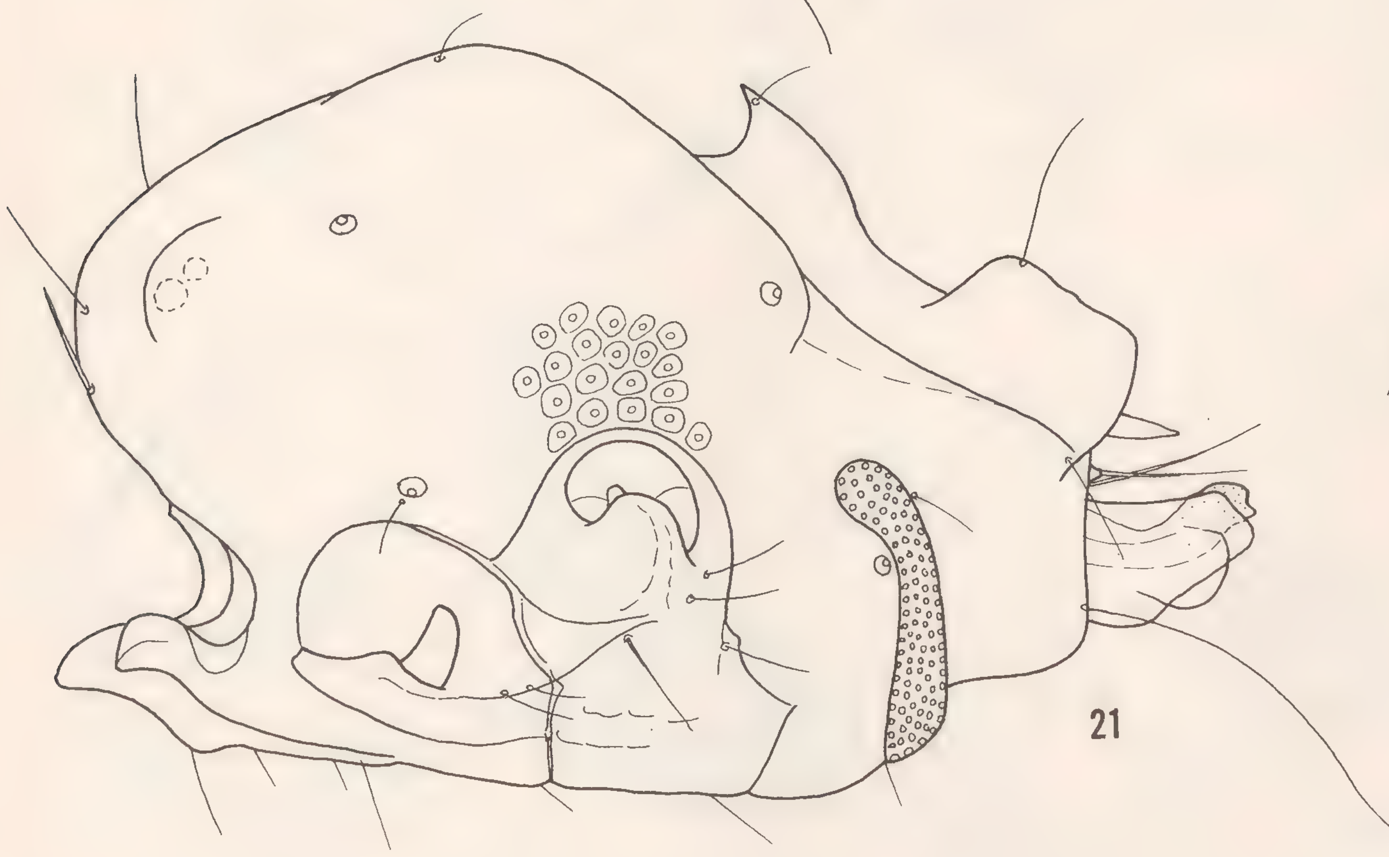
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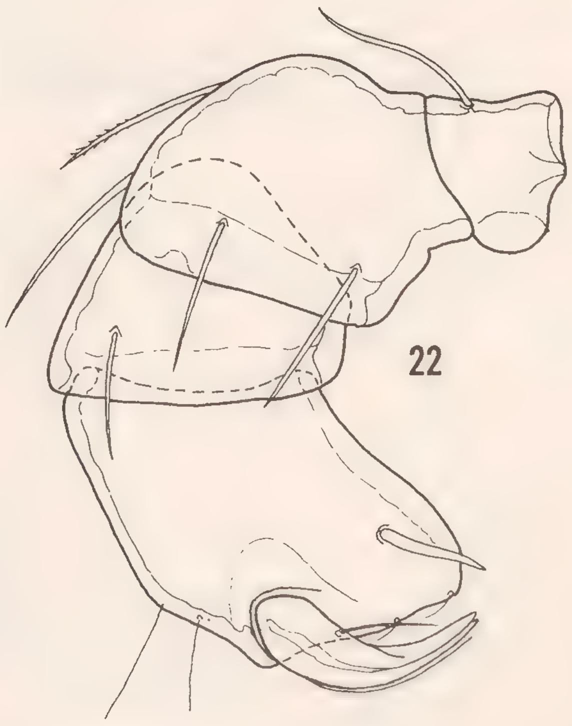
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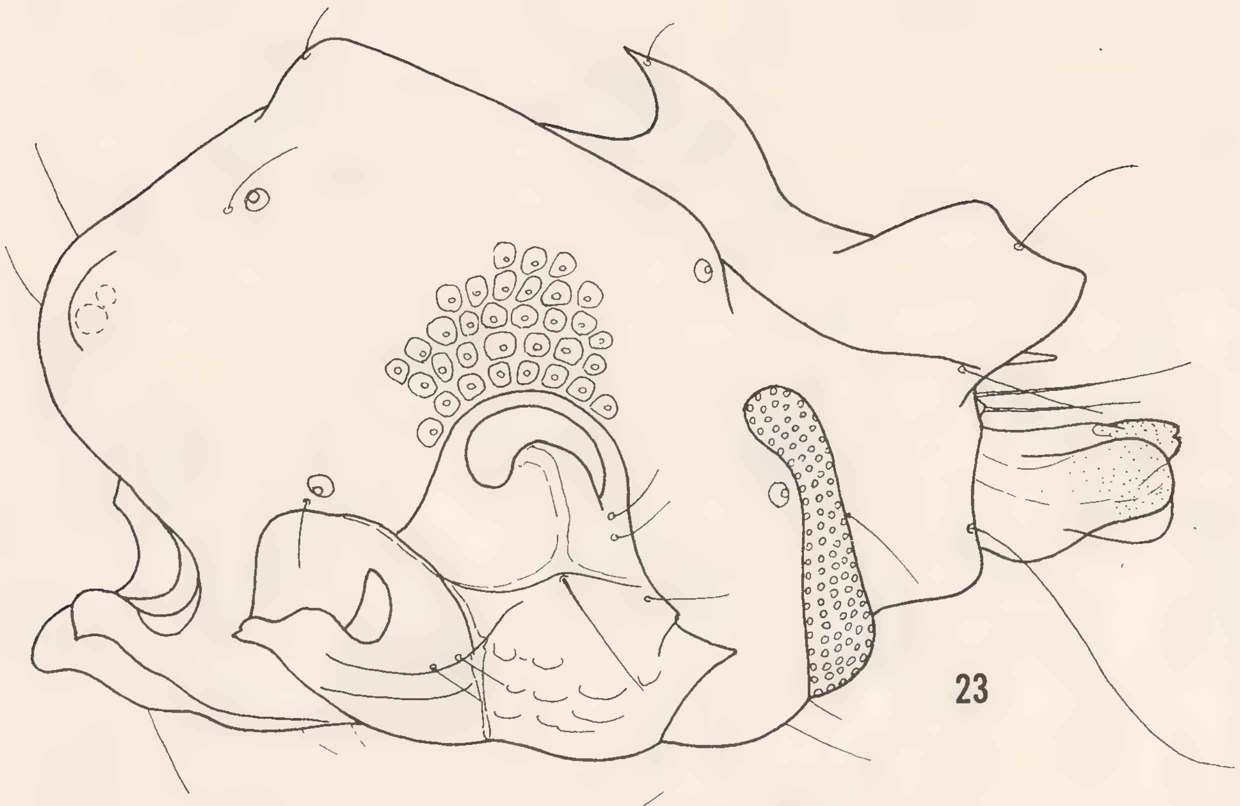
Arrenurus tamiamiensis n. sp. Fig. 19, dorsal view, ♂; Fig. 21, lateral view, ♂; Fig. 22, palp, male.
Arrenurus zapus n. sp. Fig. 20, dorsal view, ♂.



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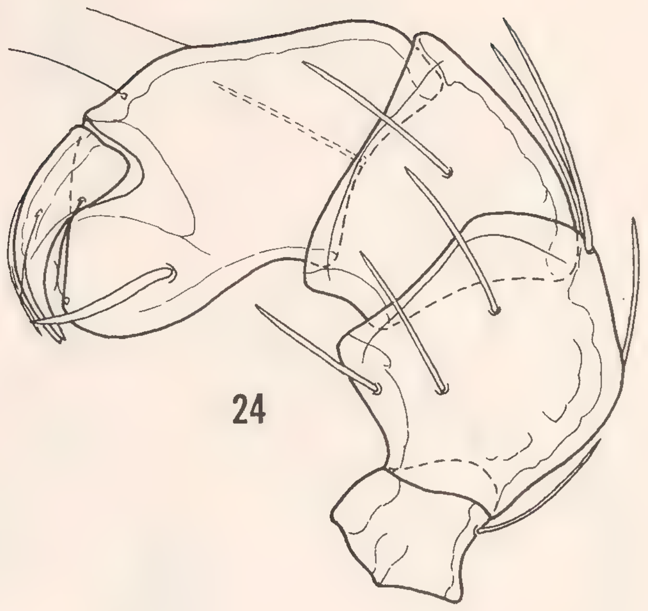

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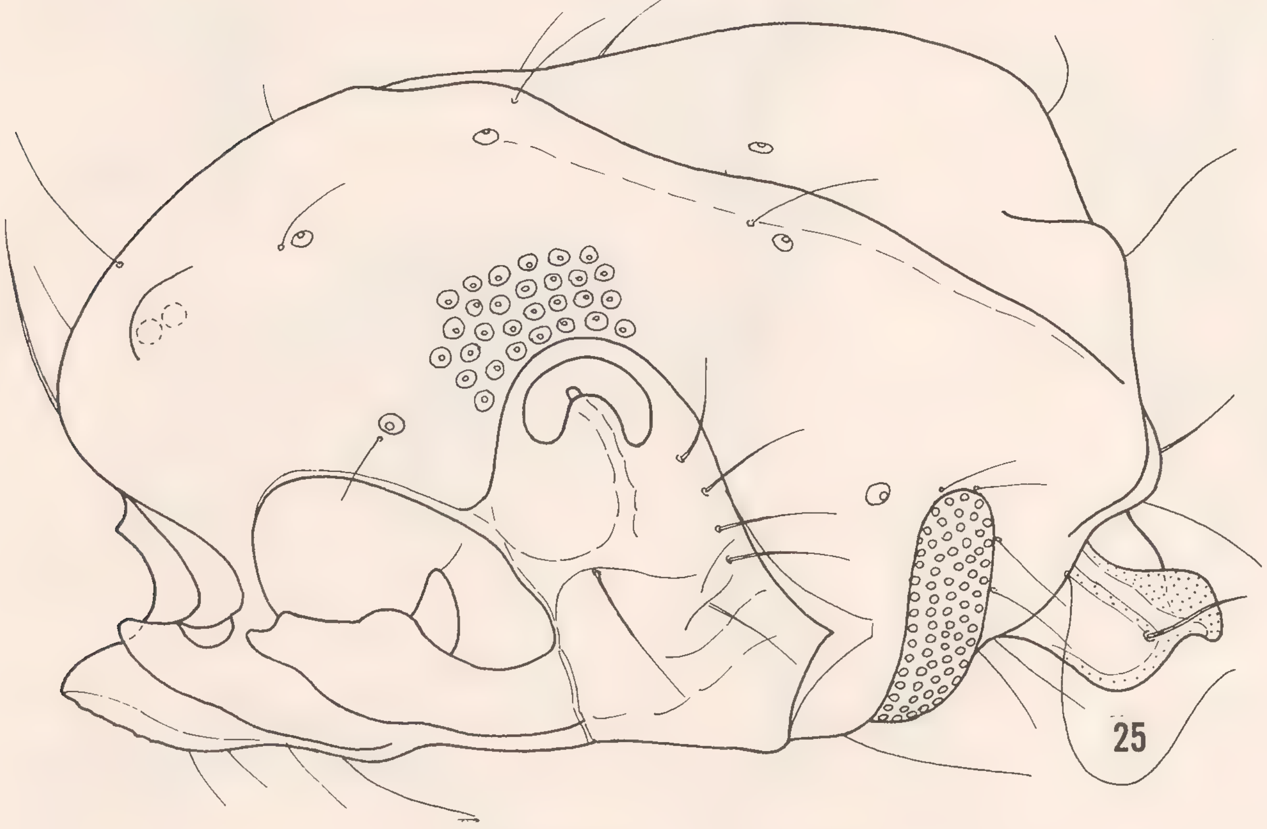

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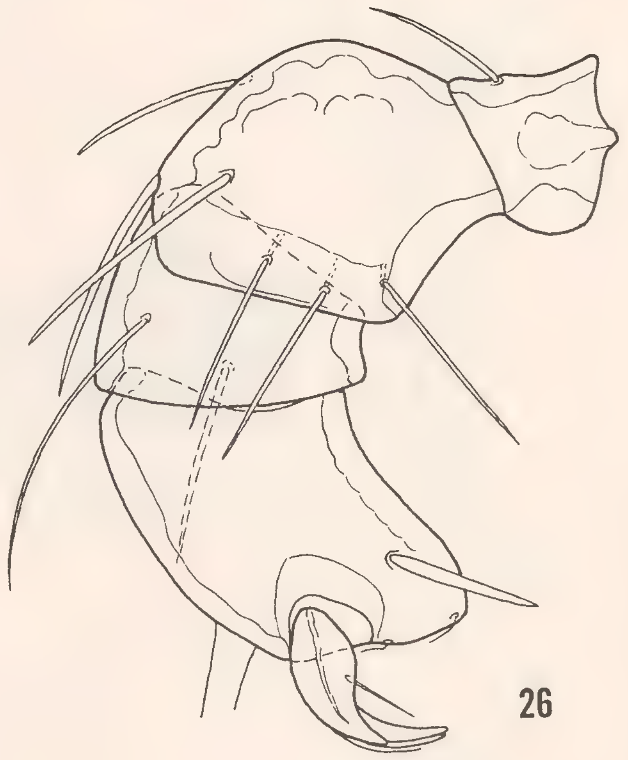

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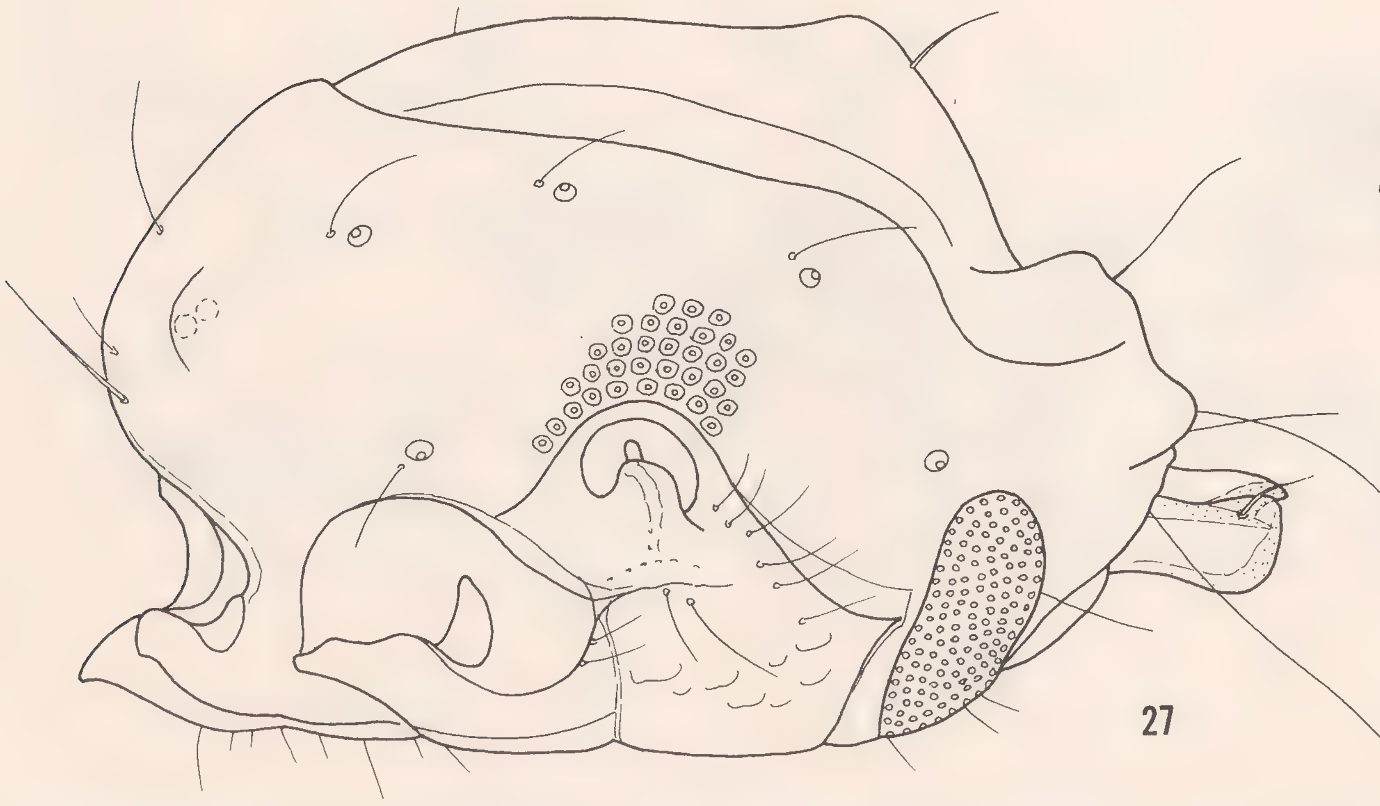

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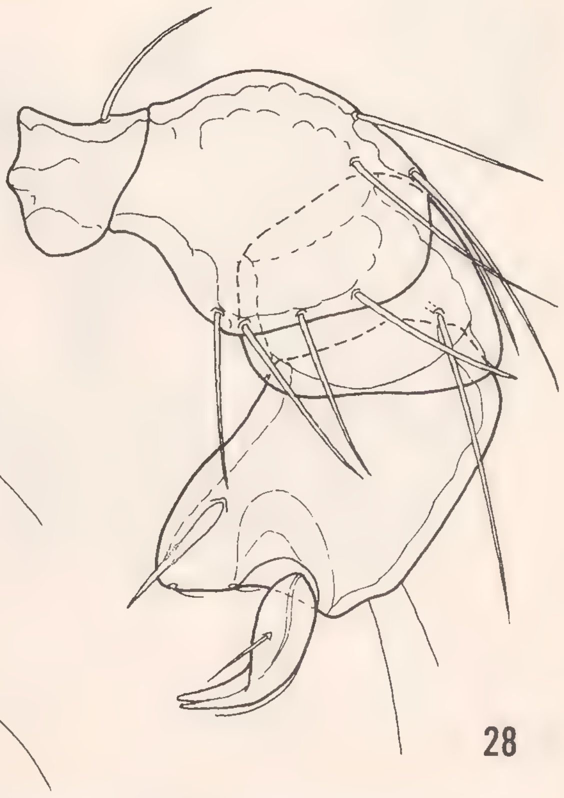
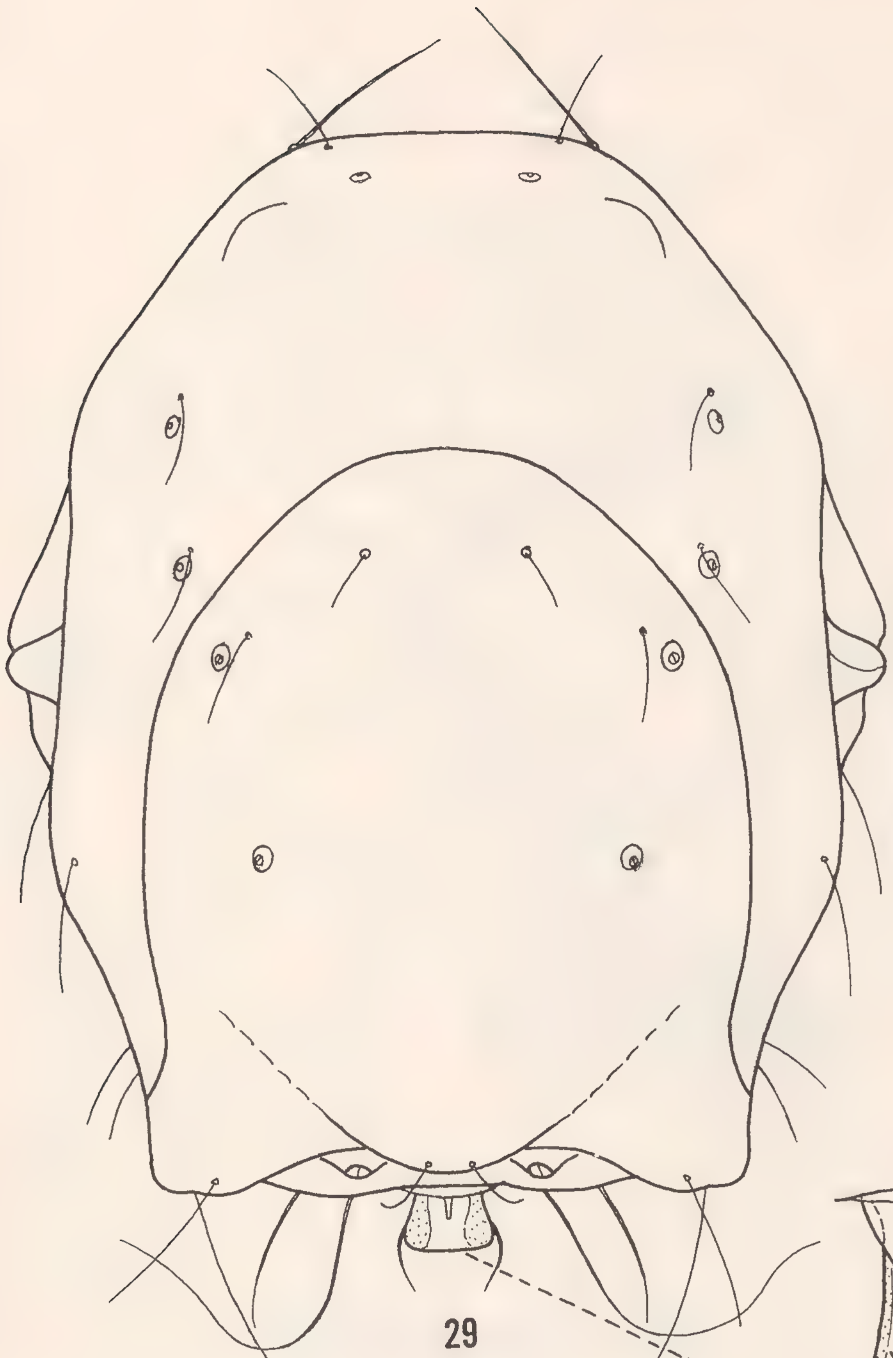


28

Arrenurus zapus n. sp. Fig. 23, lateral view, ♂; Fig. 24, palp, ♂.
Arrenurus arizonensis n. sp. Fig. 25, lateral view, ♂; Fig. 26, palp, ♂.
Arrenurus harperae n. sp. Fig. 27, lateral view, ♂; Fig. 28, palp, ♂.



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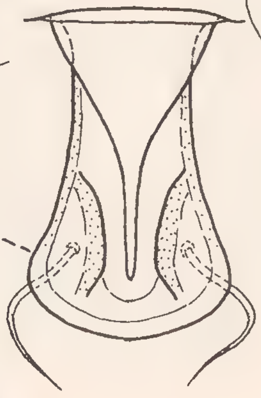

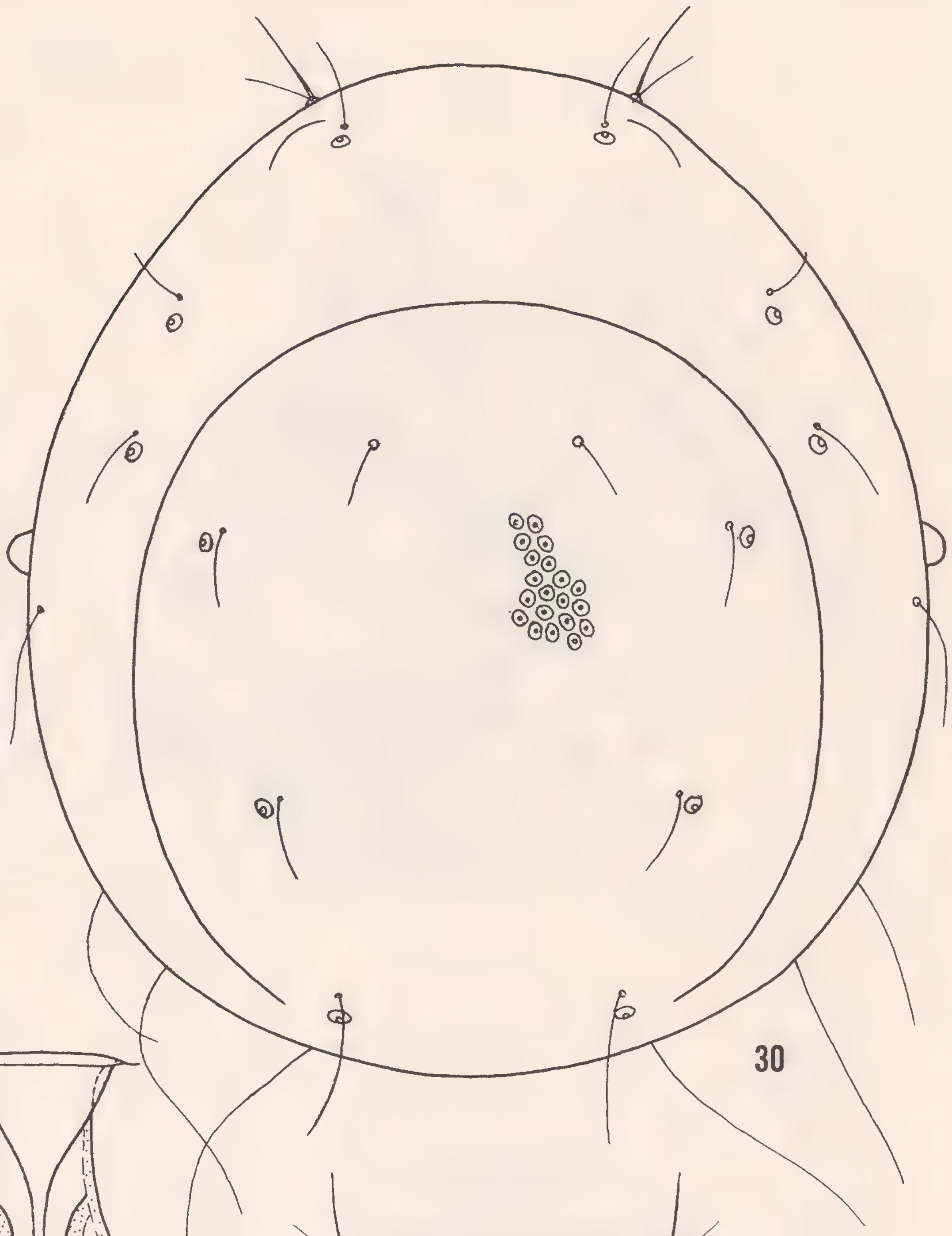

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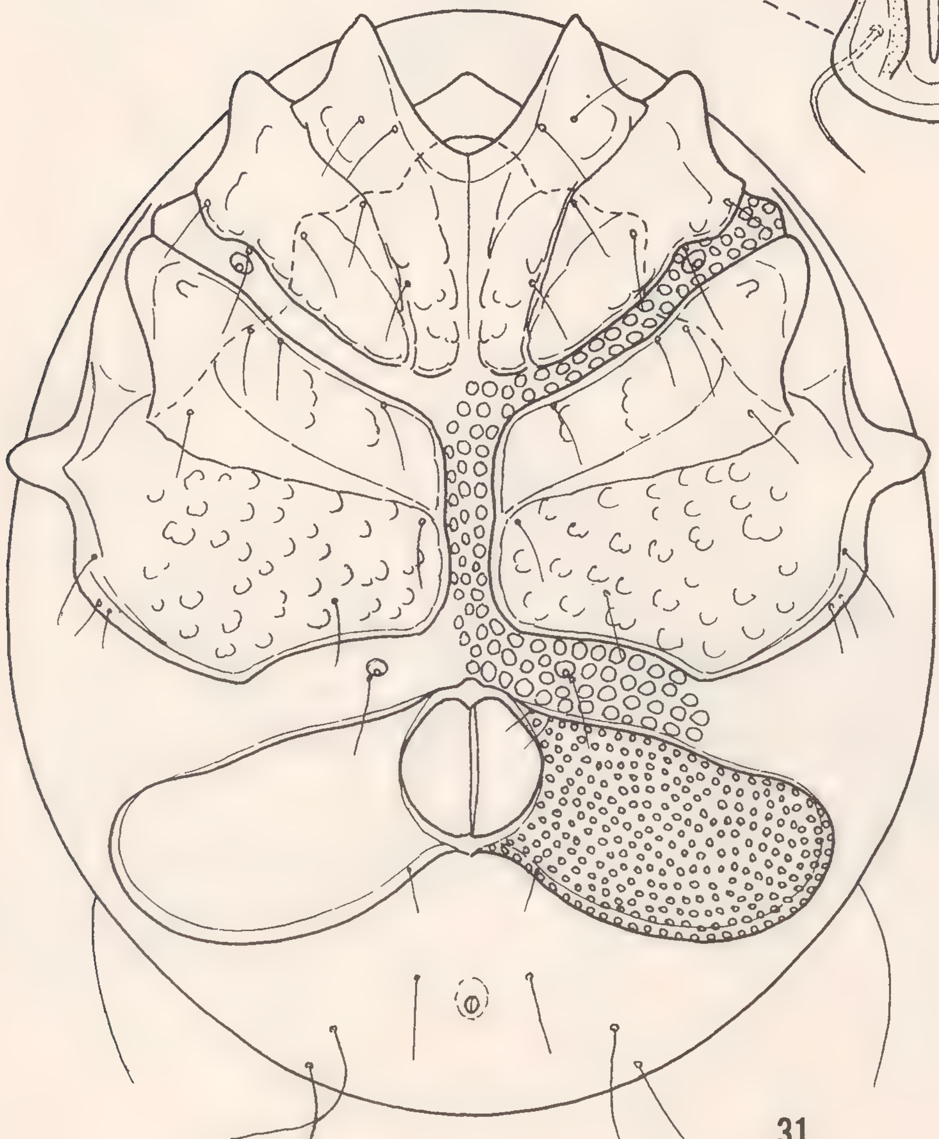

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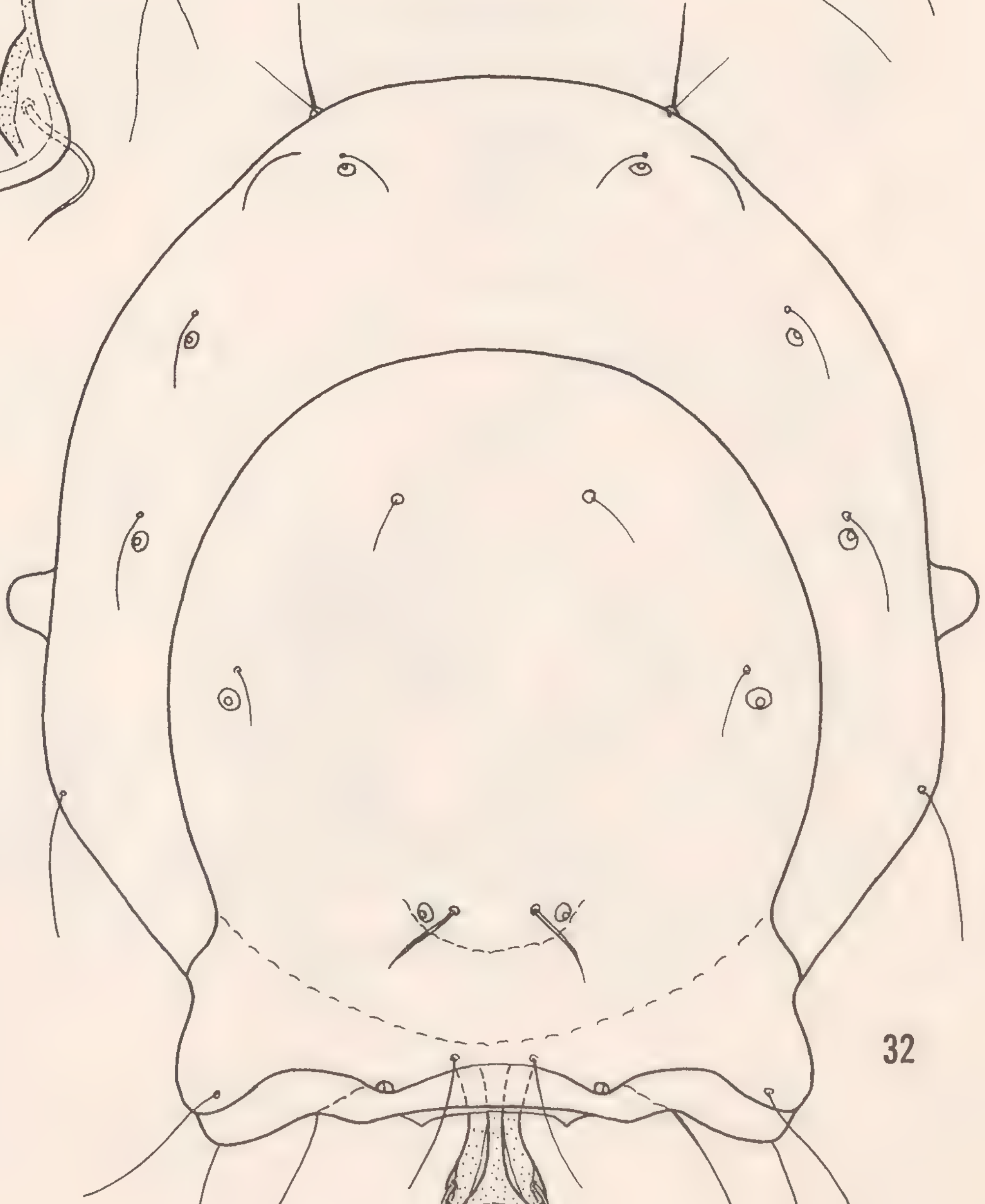
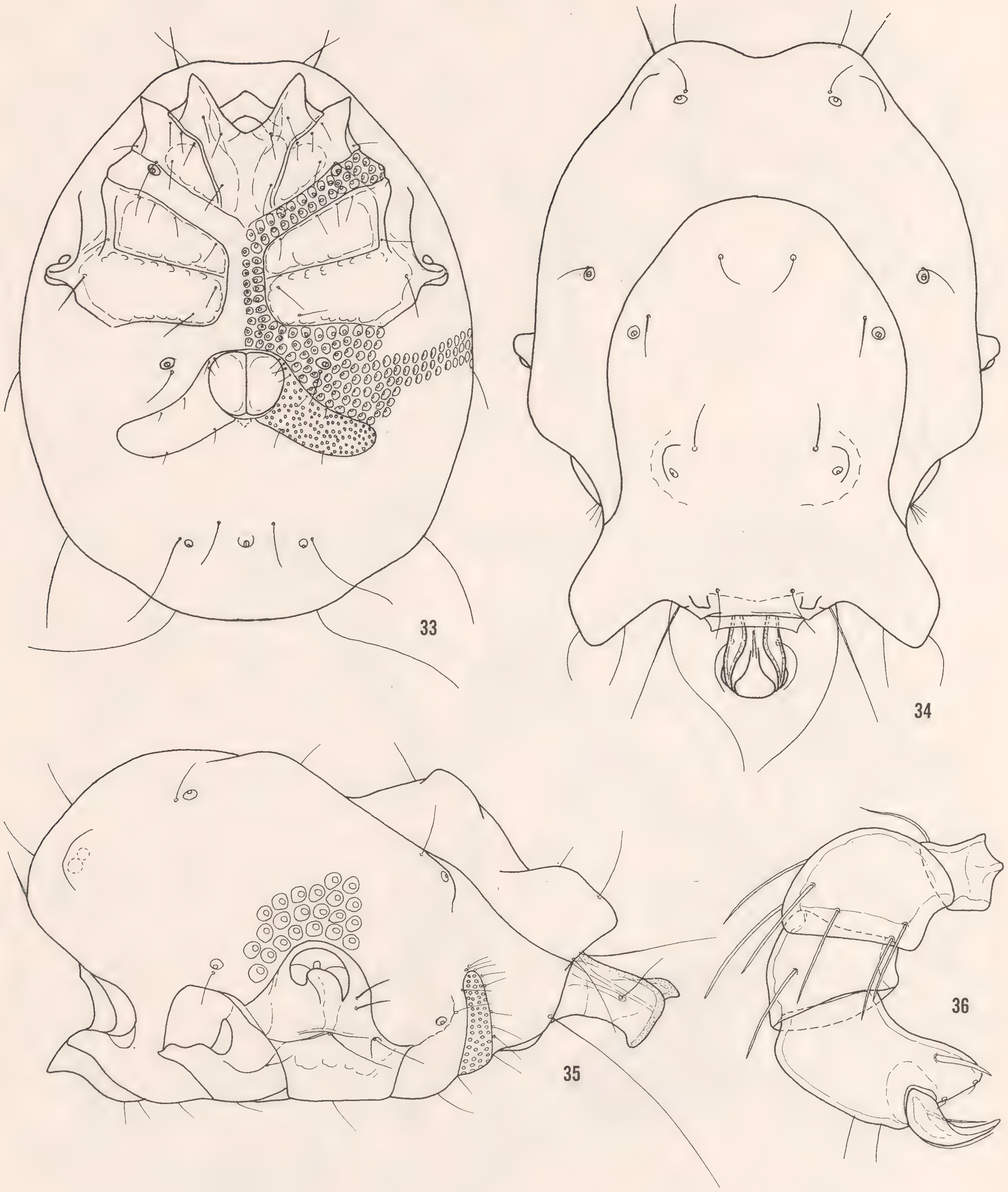


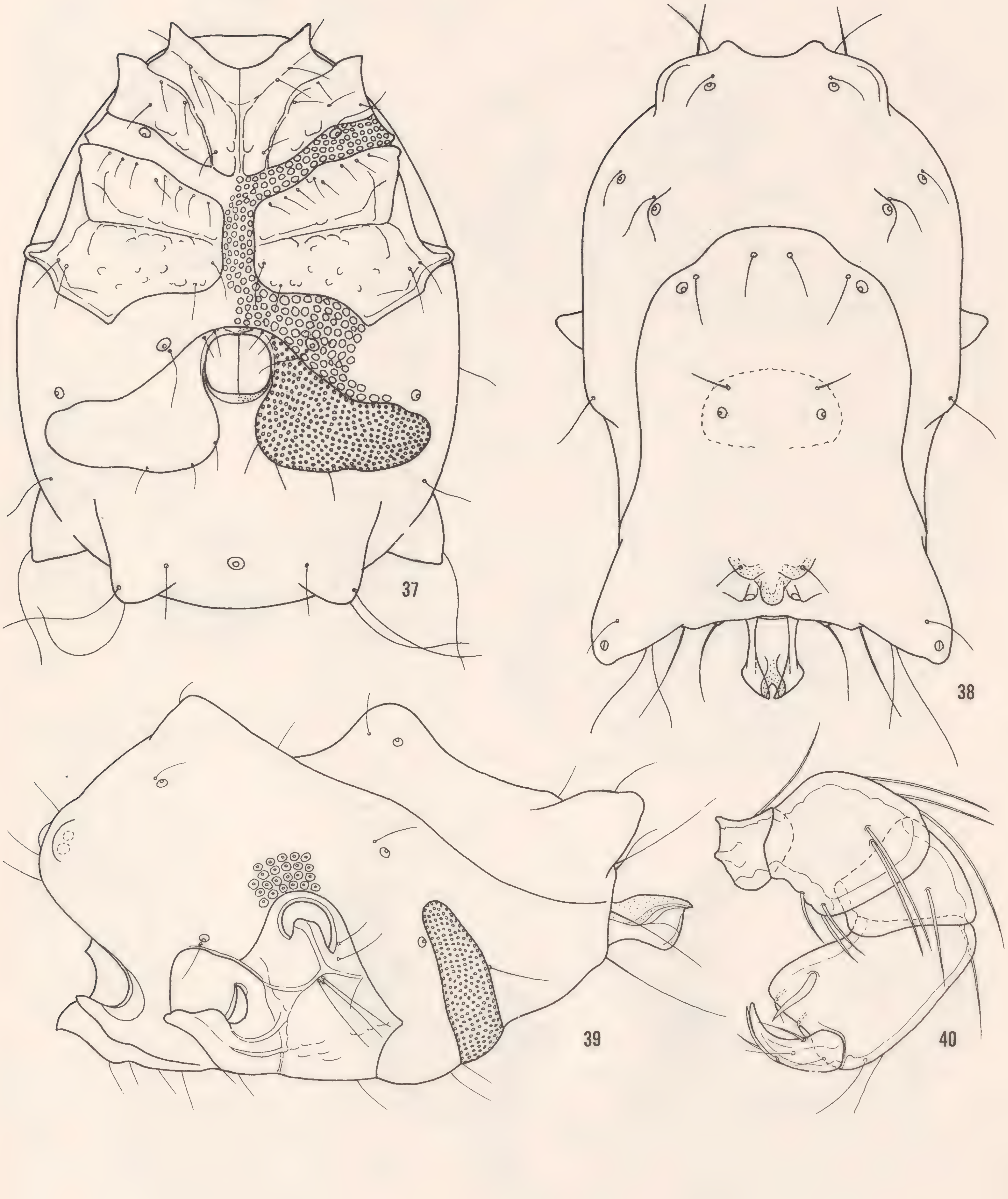
32

Arrenurus arizonensis n. sp. Fig. 29, dorsal view ♂ (subfigure, posterodorsal view of petiole).

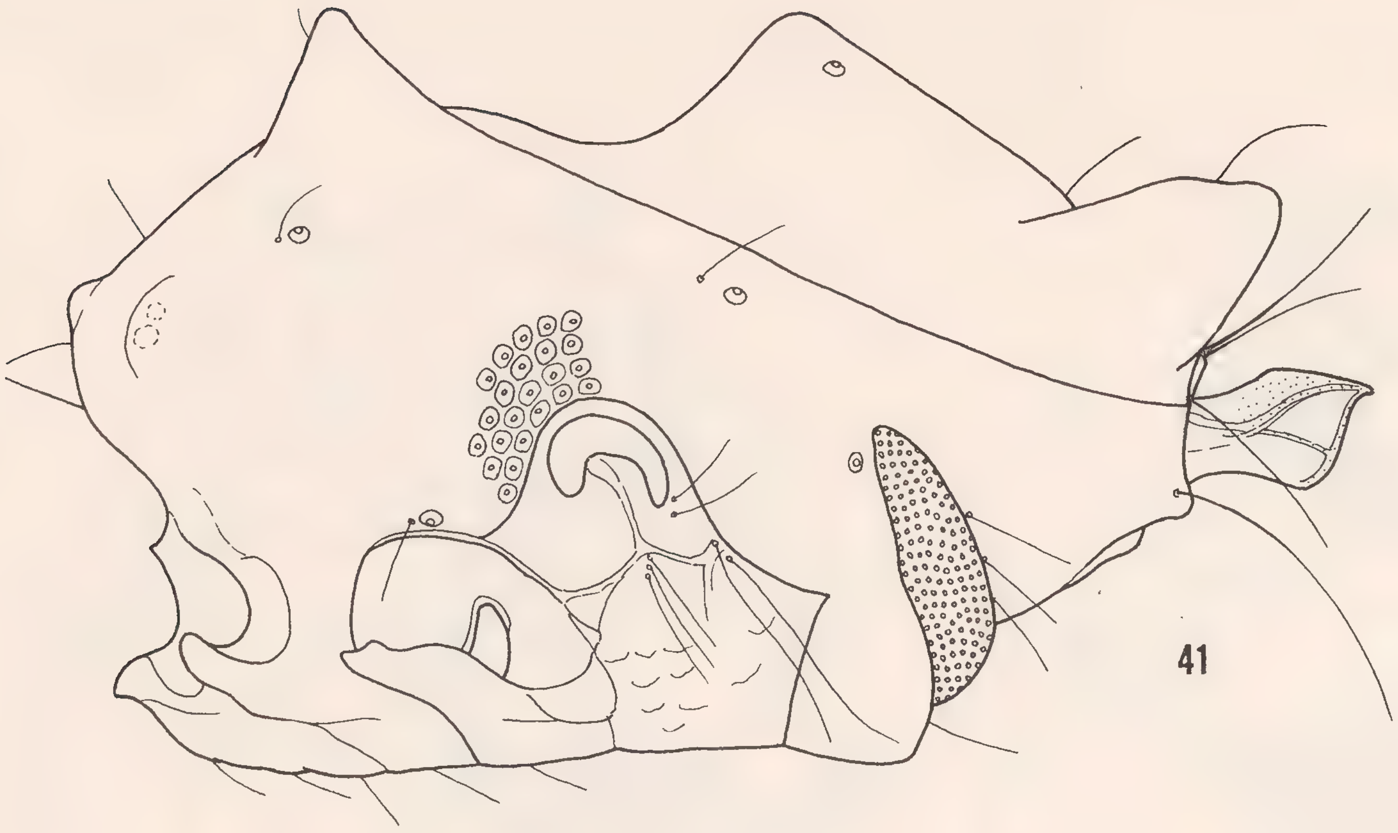
Arrenurus harperae n. sp. Fig. 30, dorsal view, ♀; Fig. 31, ventral view, ♀; Fig. 32, dorsal view, ♂.



Arrenurus wilsoni n. sp. Fig. 33, ventral view, ♀; Fig. 34, dorsal view, ♂; Fig. 35, lateral view, ♂; Fig. 36, palp, ♀.



Arrenurus facetus n. sp. Fig. 37, ventral view, ♀; Fig. 38, dorsal view, ♂; Fig. 39, lateral view, ♂; Fig. 40, palp, ♀.



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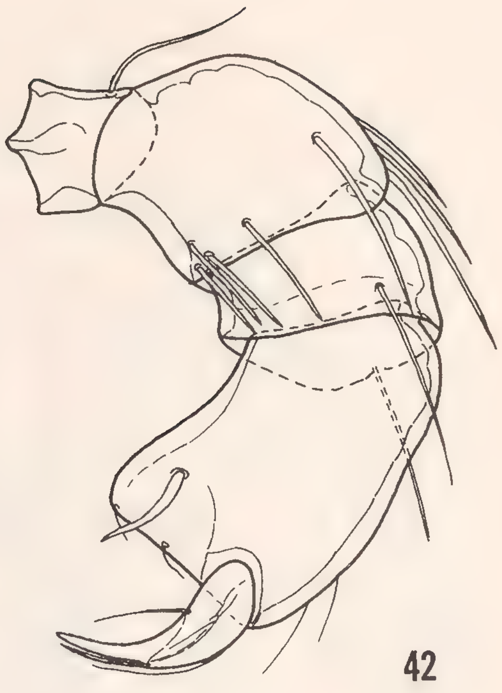

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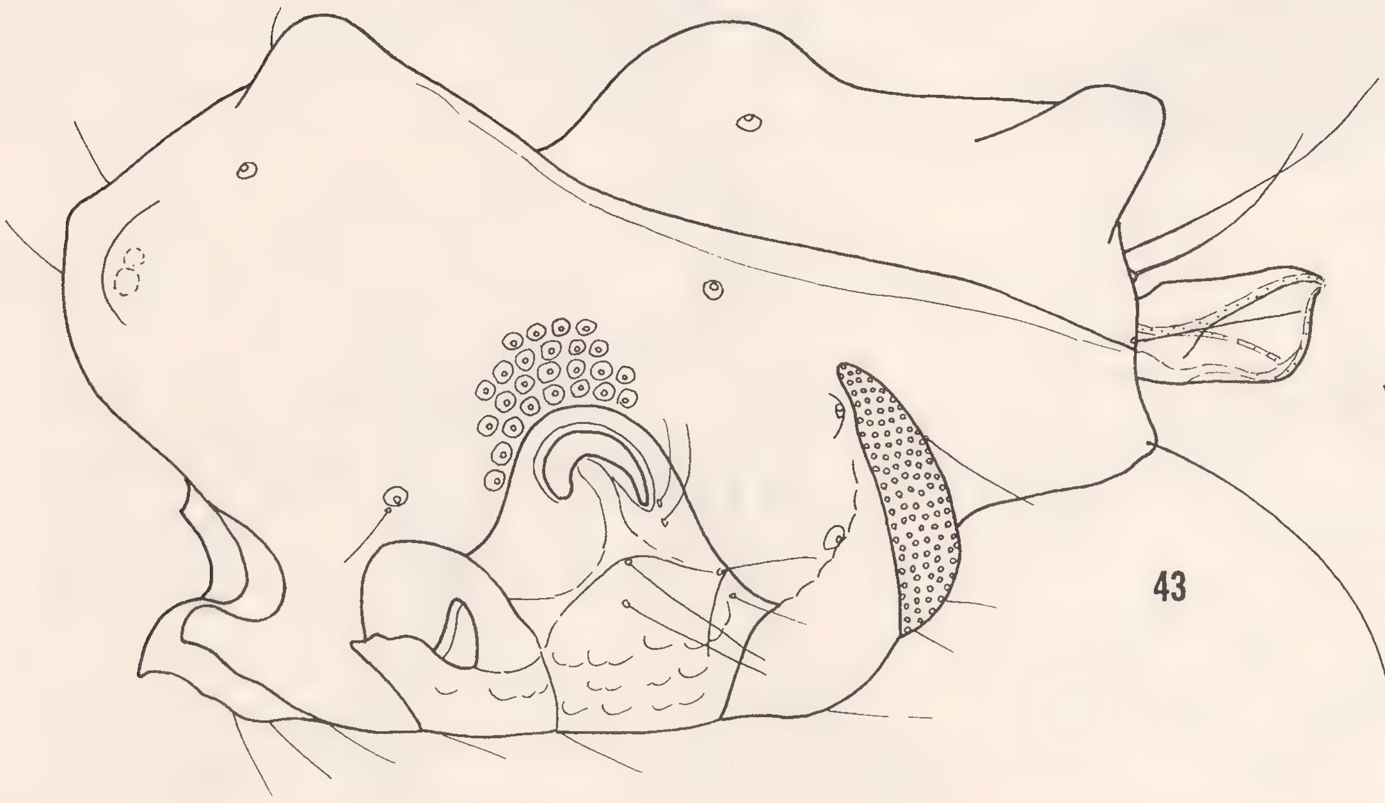

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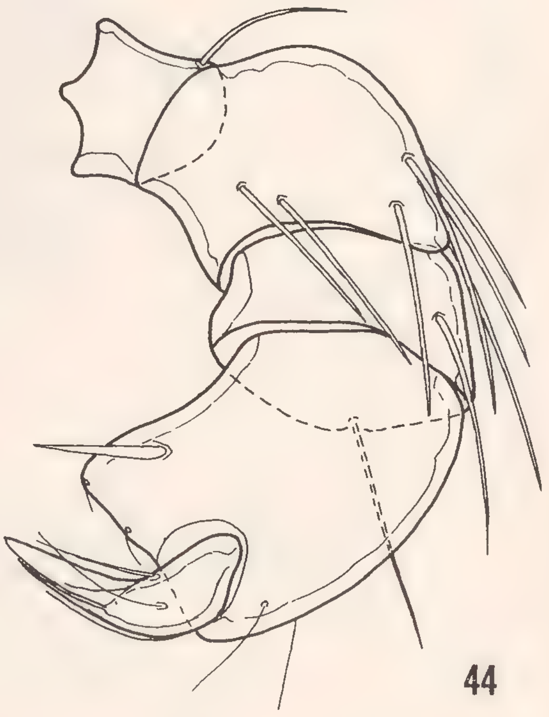

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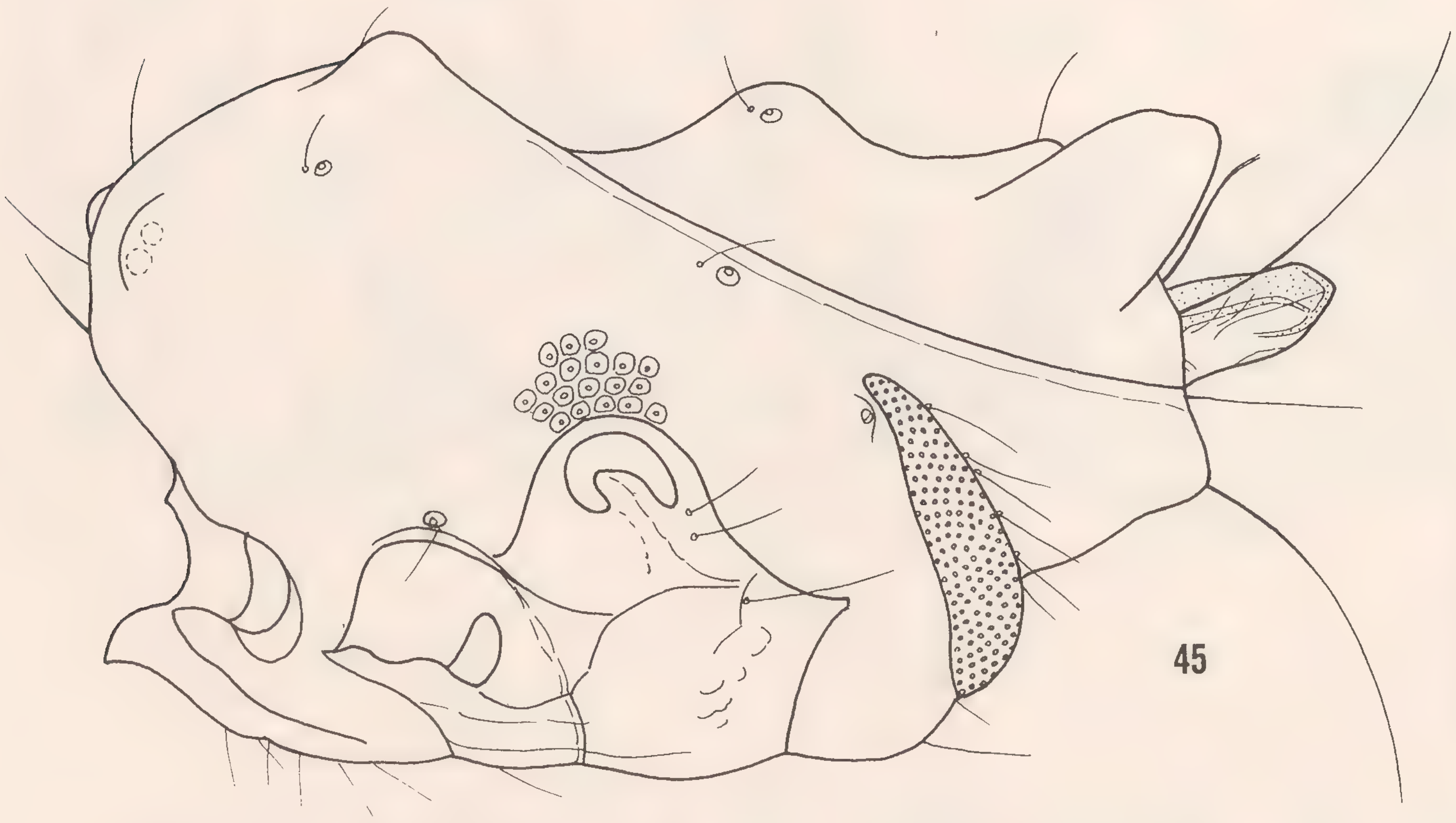

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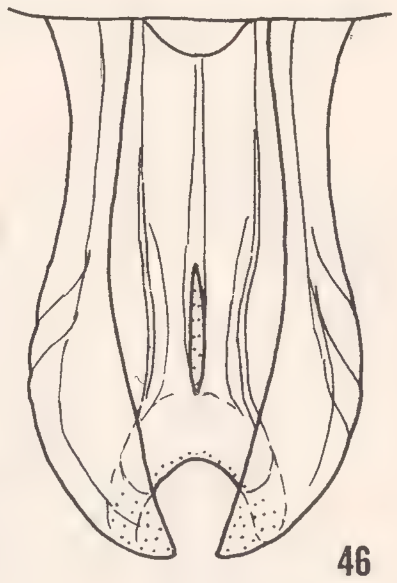

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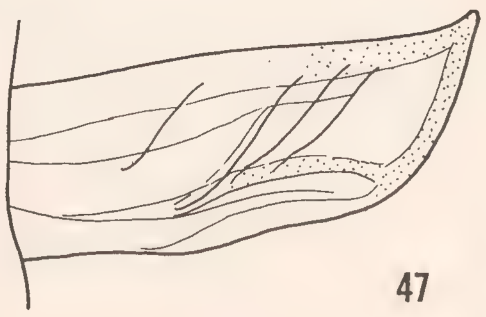

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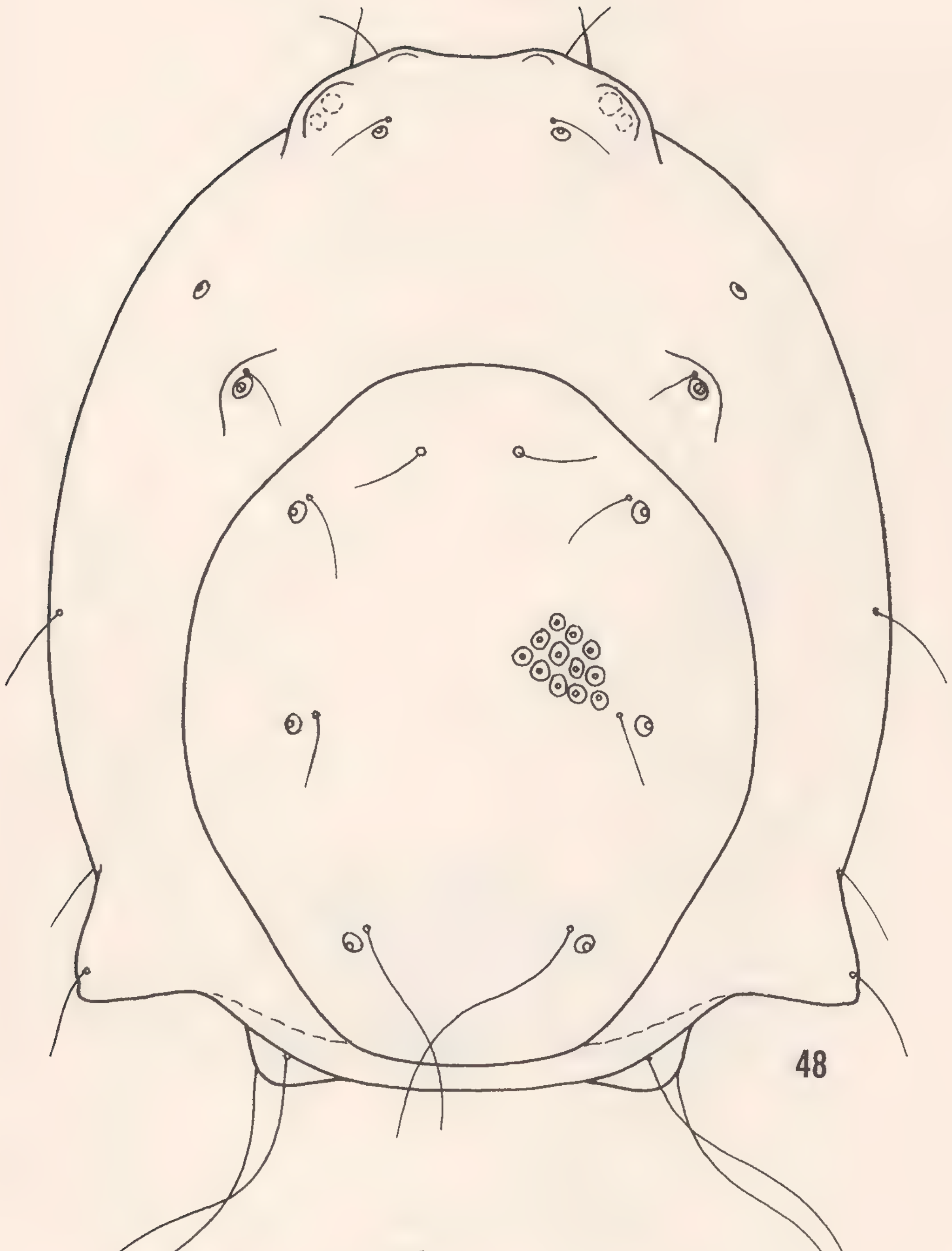
Arrenurus facetopsis n. sp. Fig. 41, lateral view, ♂.
Arrenurus omarus n. sp. Fig. 42, palp, ♂; Fig. 45, lateral view, ♂.
Arrenurus parasuperior n. sp. Fig. 43, lateral view, ♂; Fig. 44, palp, ♂.
Arrenurus wallensis Cook Fig. 46, dorsal view of petiole, ♂; Fig. 47, lateral view of petiole, ♂.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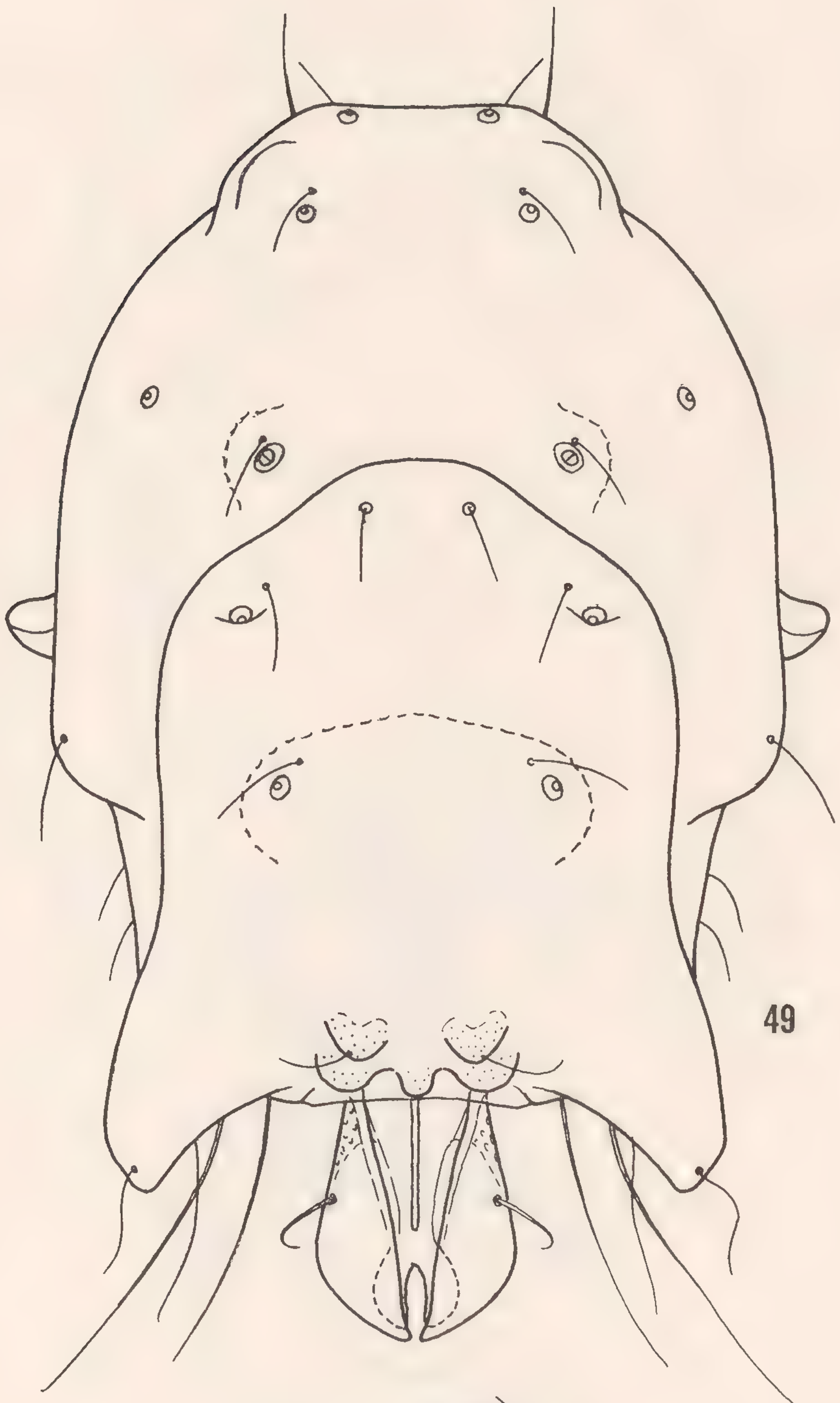
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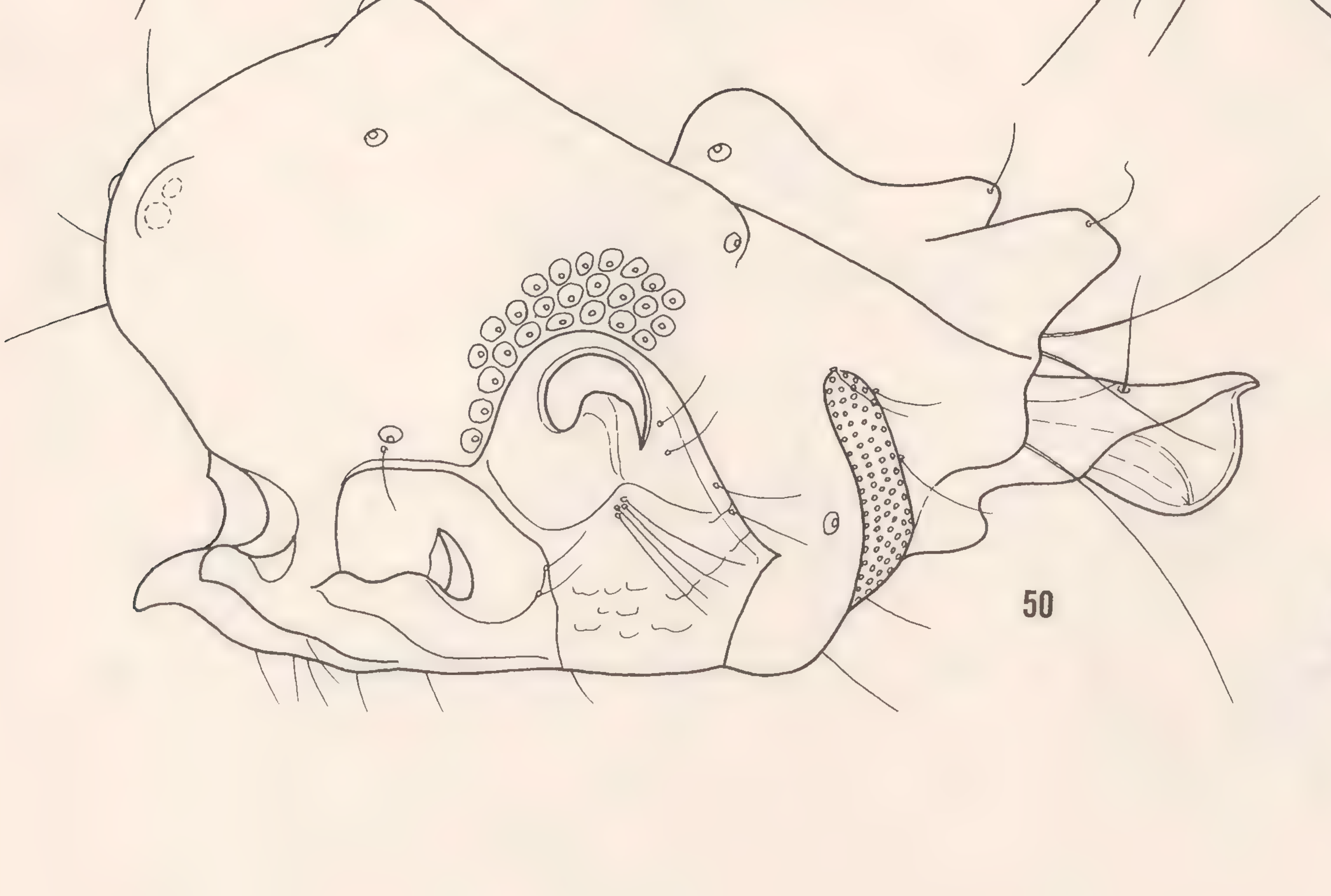
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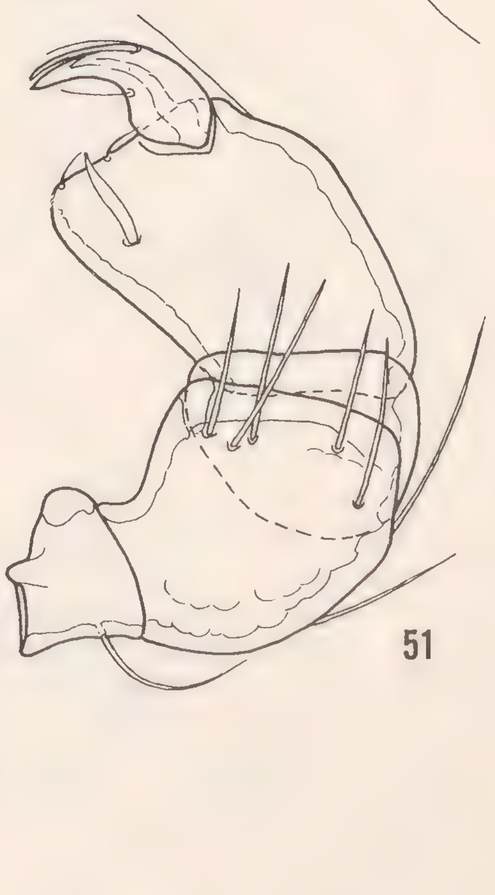
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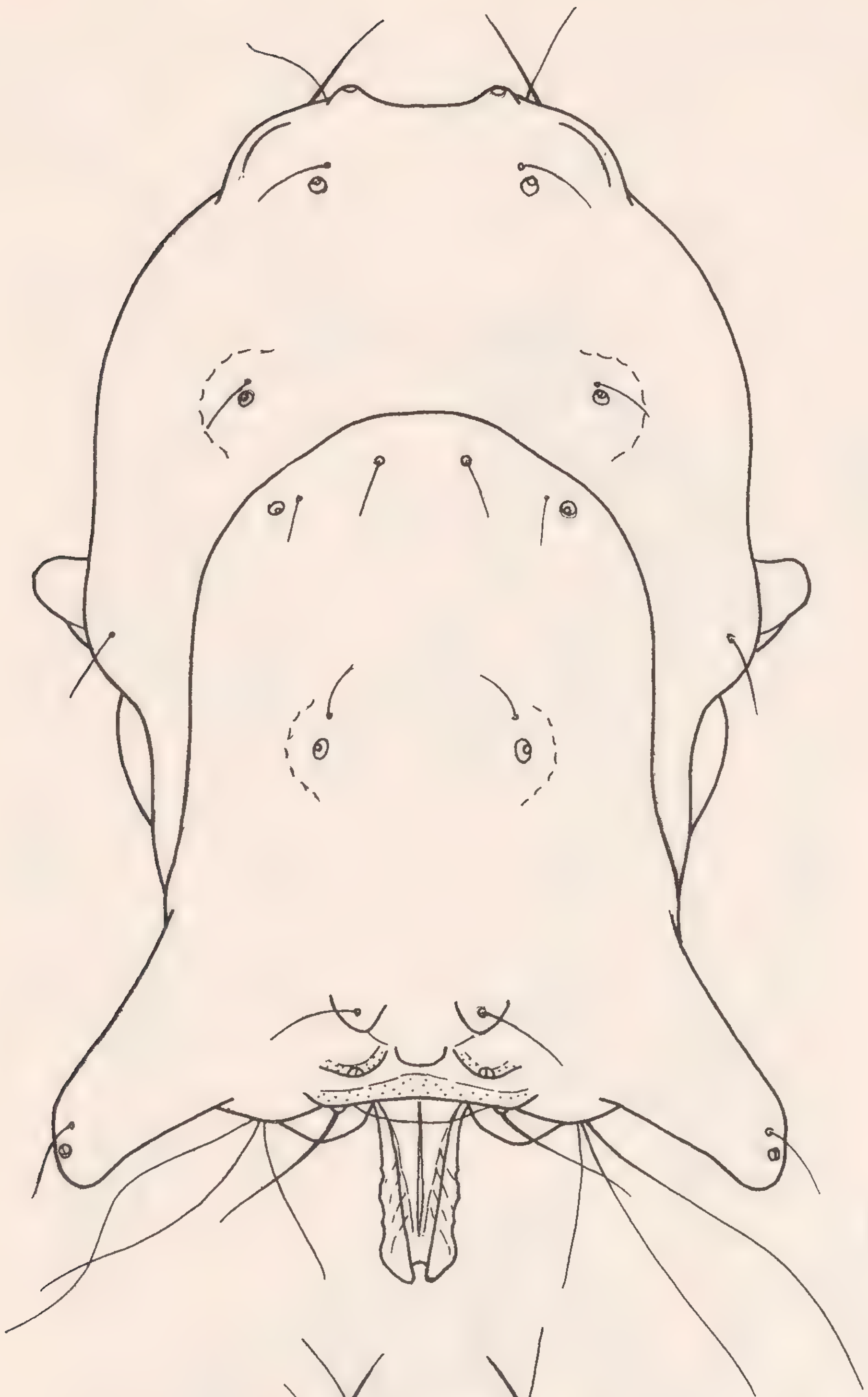
Arrenurus facetus n. sp. Fig. 48, dorsal view, ♀.
Arrenurus beltistus n. sp. Fig. 49, dorsal view, ♂; Fig. 50, lateral view, ♂; Fig. 51, palp, male.



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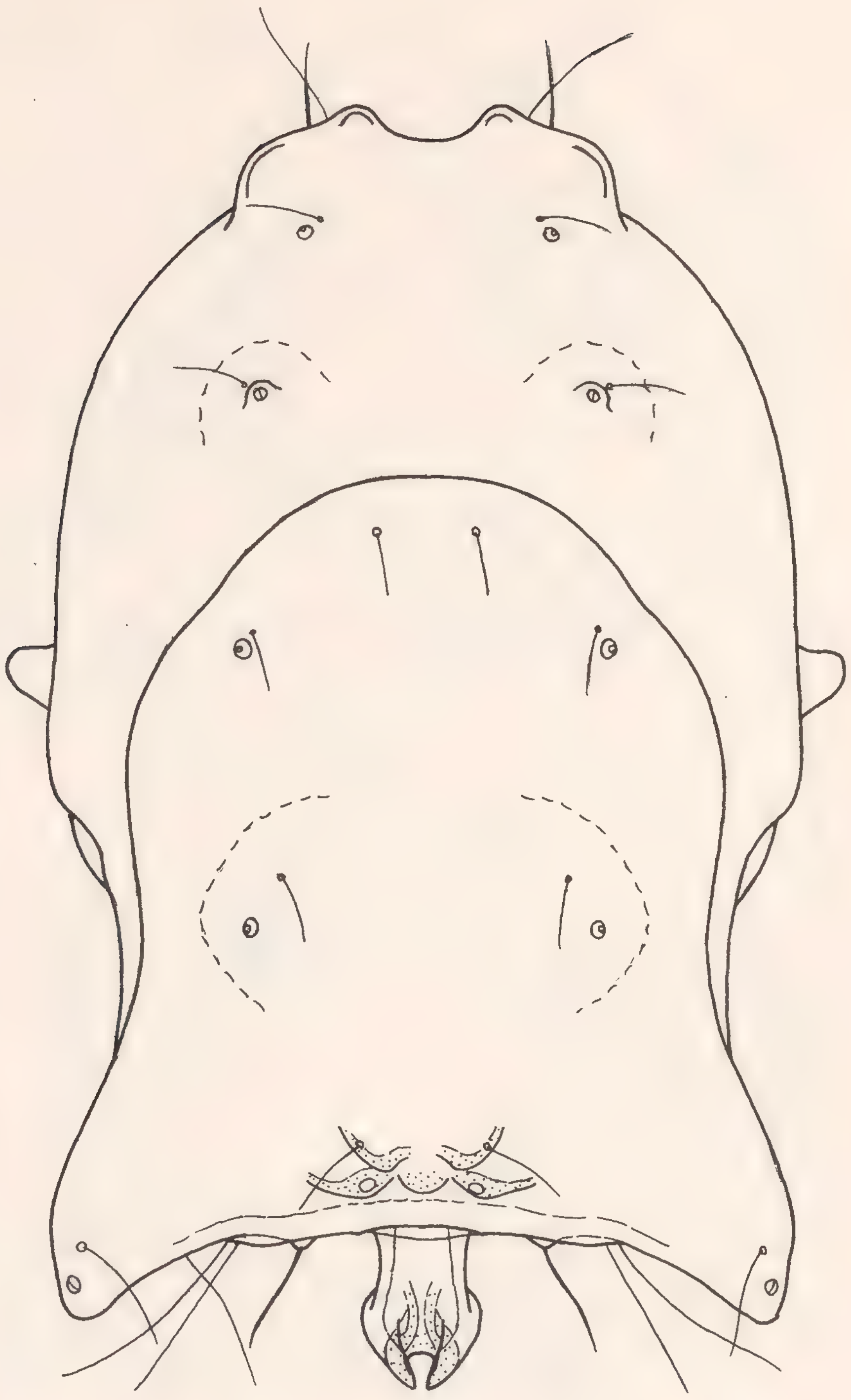

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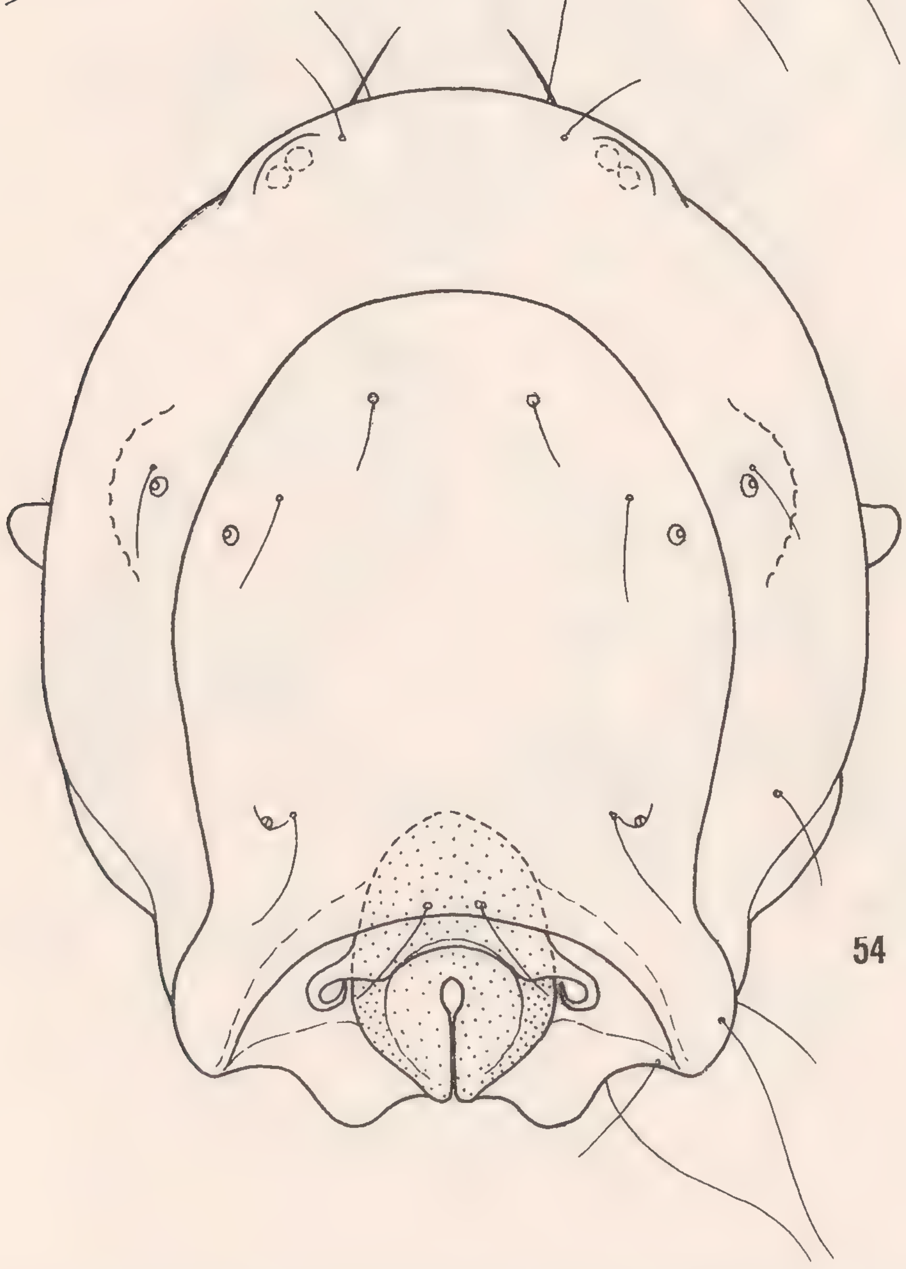

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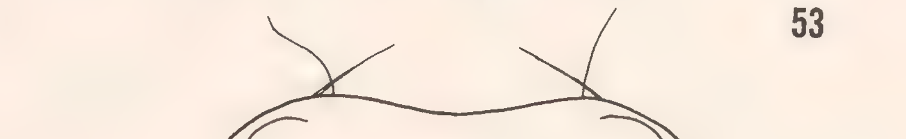
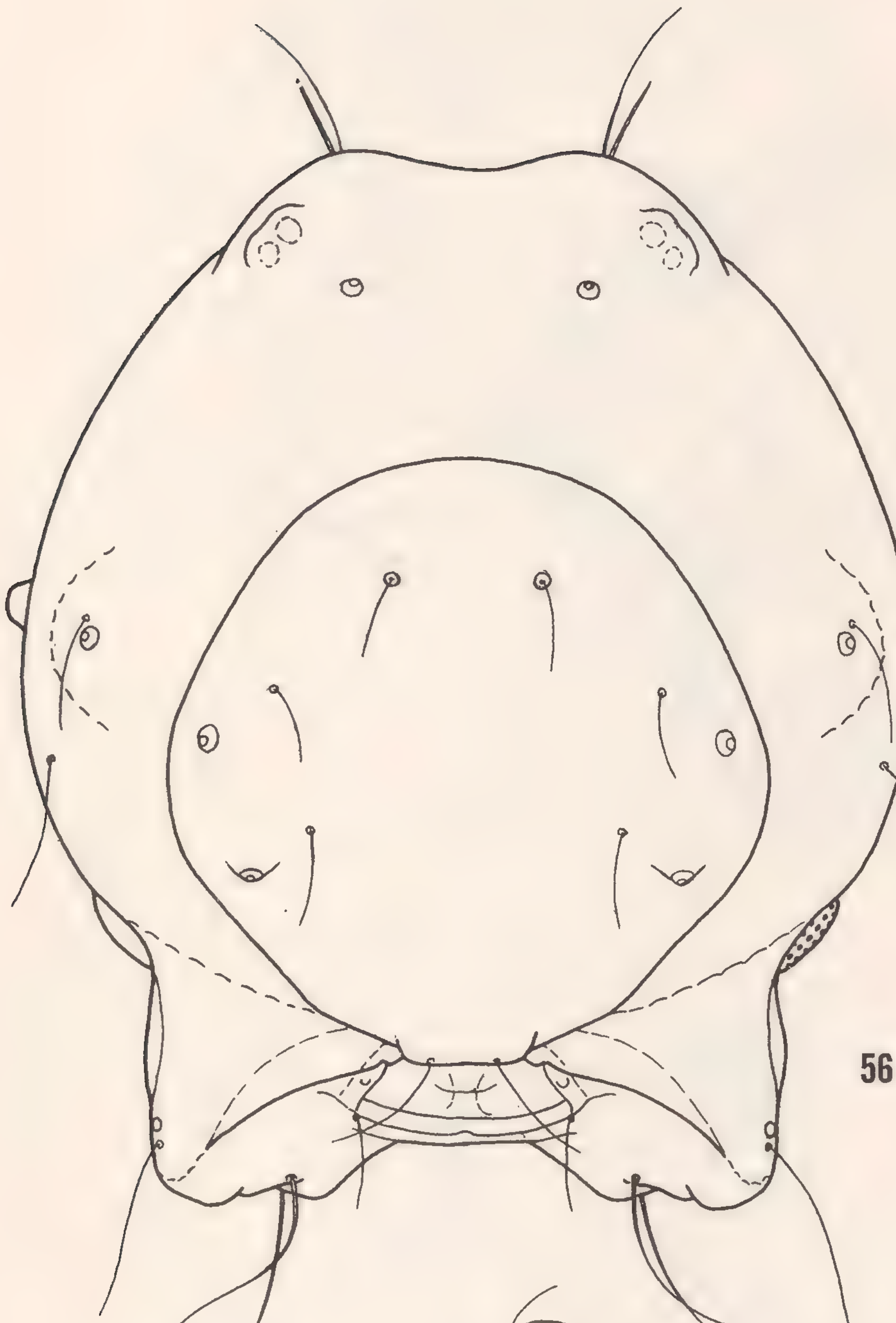


55

Arrenurus omarus n. sp. Fig. 52, dorsal view, ♂.
Arrenurus facetopsis n. sp. Fig. 53, dorsal view, ♂.
Arrenurus floridensis n. sp. Fig. 54, dorsal view, ♂.
Arrenurus neocrenellatus n. sp. Fig. 55, dorsal view, ♂.



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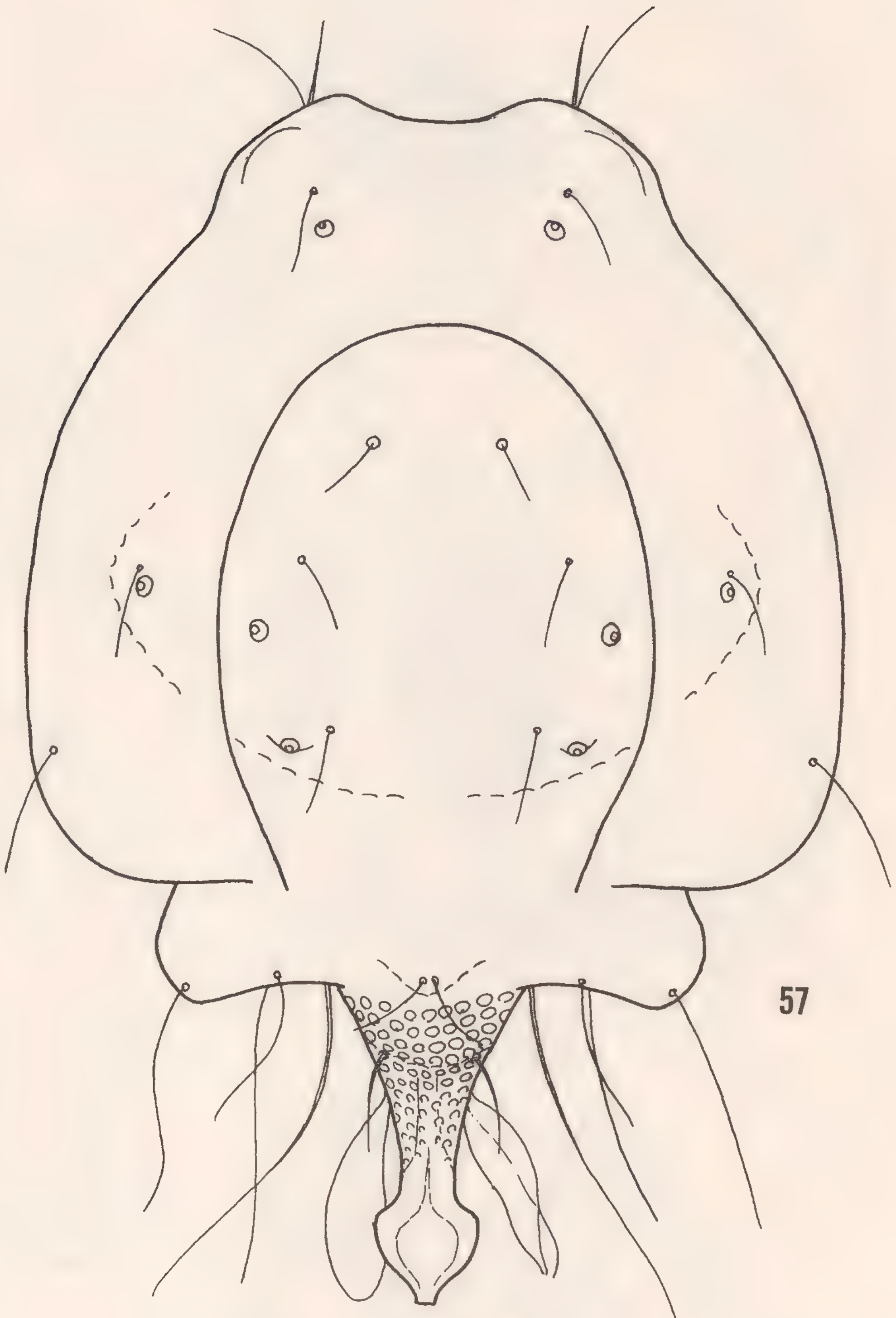

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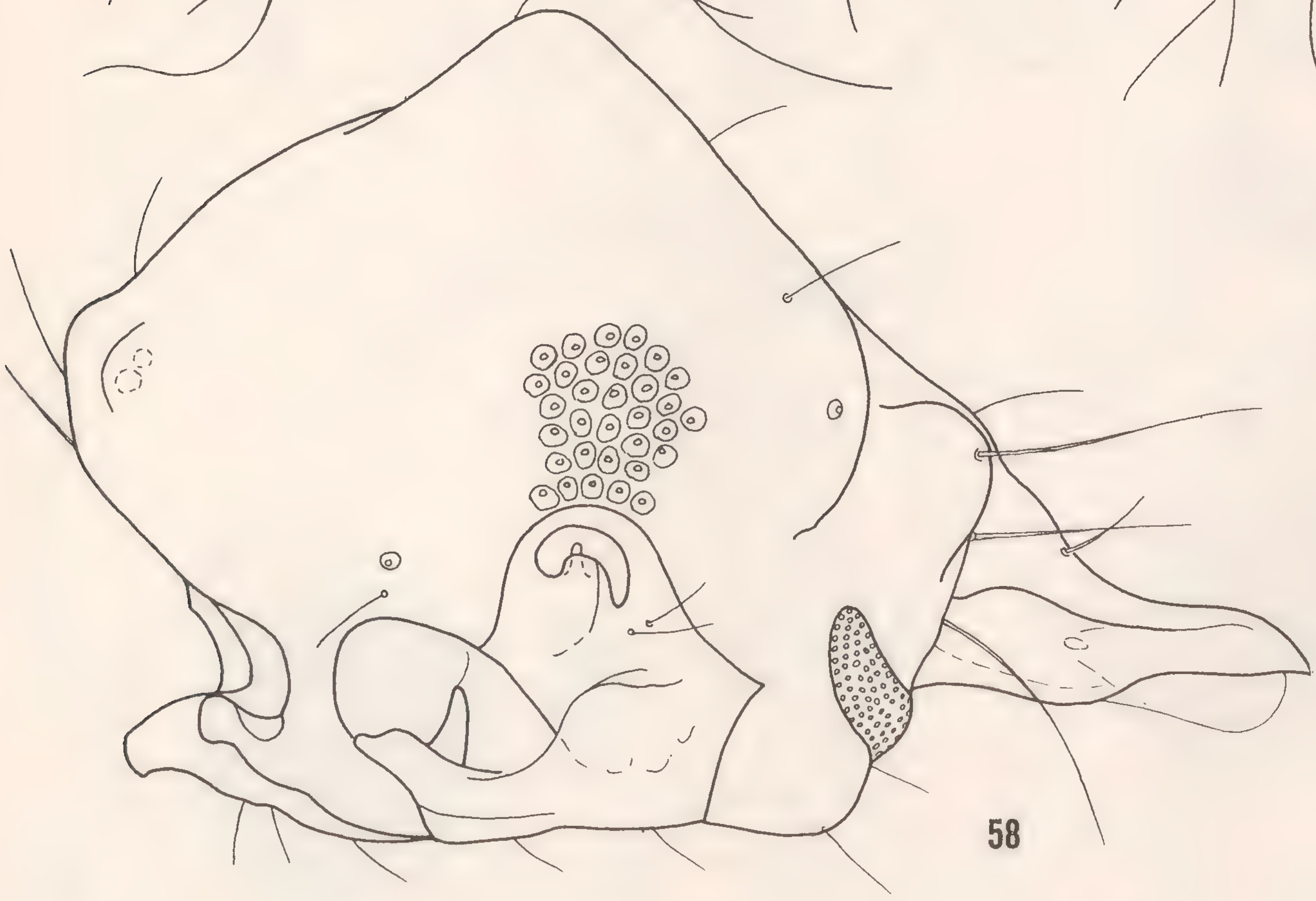

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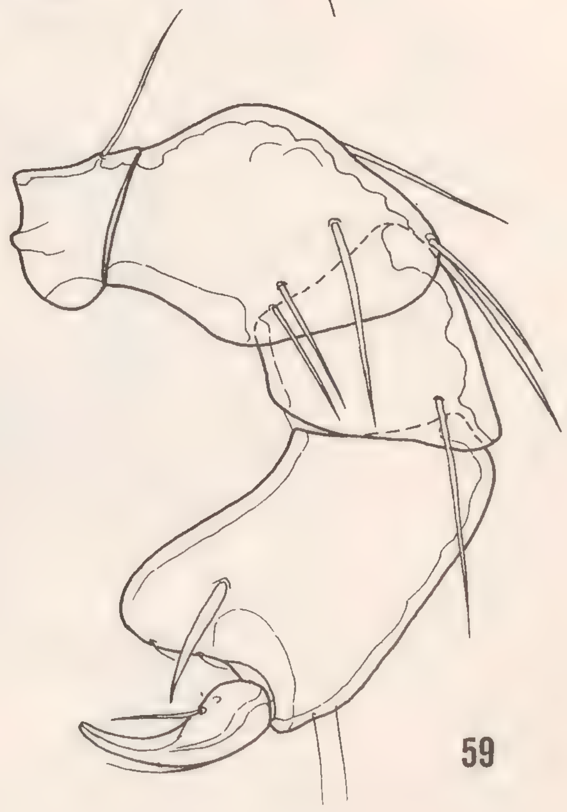
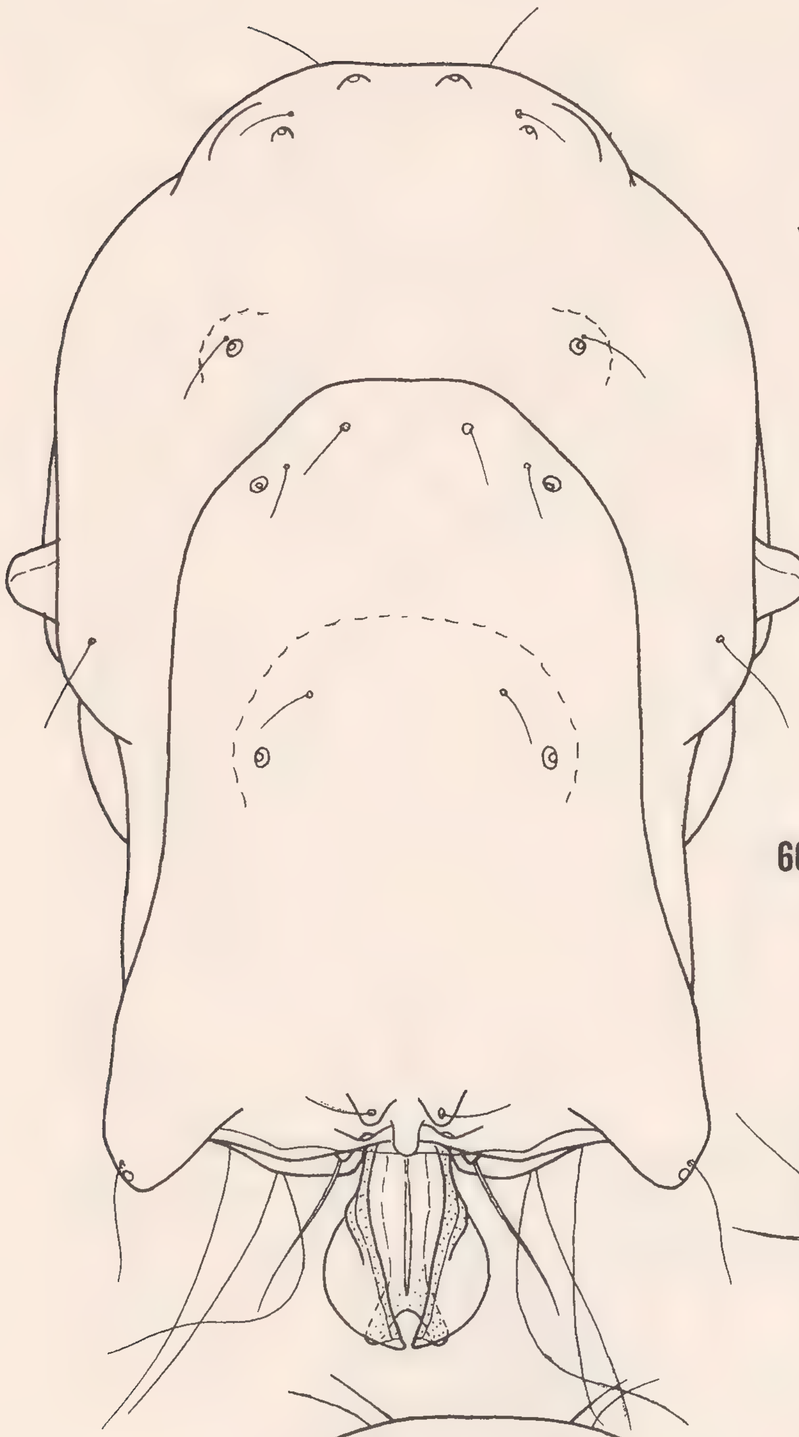


59

Arrenurus immokaleensis n. sp. Fig. 56, dorsal view, ♂.
Arrenurus ziseri n. sp. Fig. 57, dorsal view, ♂; Fig. 58, lateral view, ♂;
Fig. 59, palp, ♂.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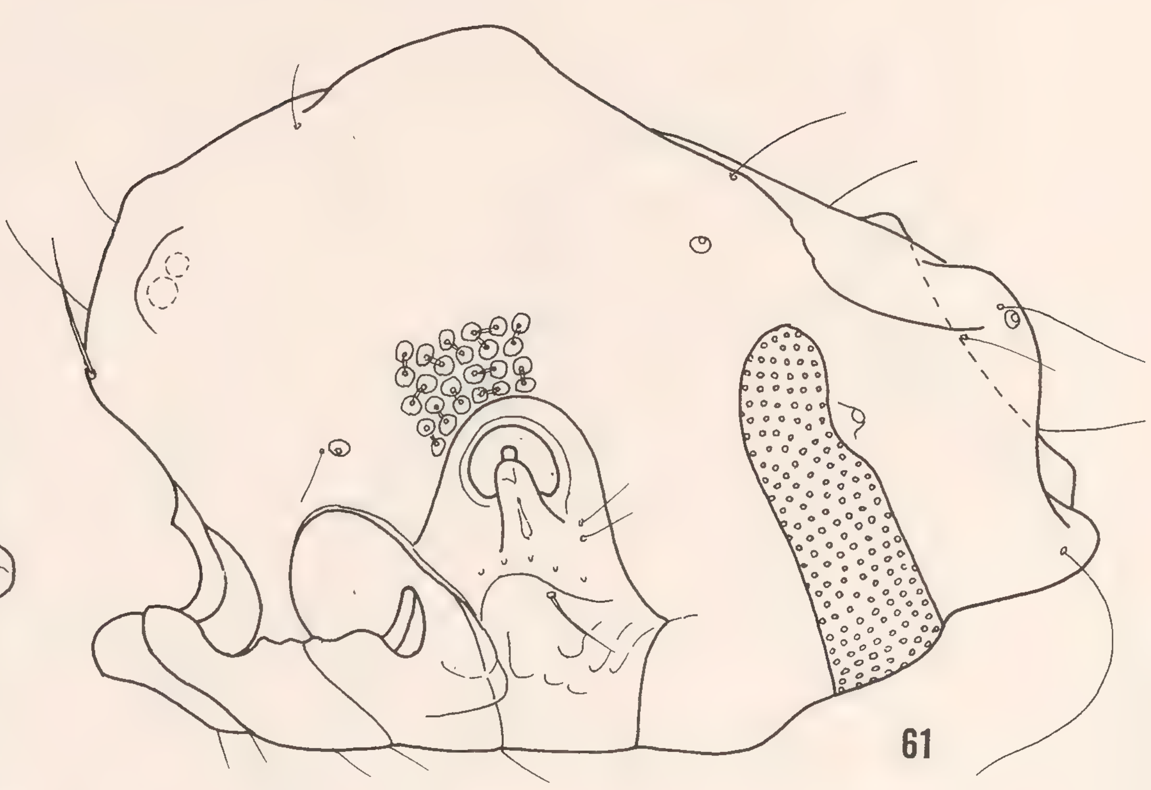
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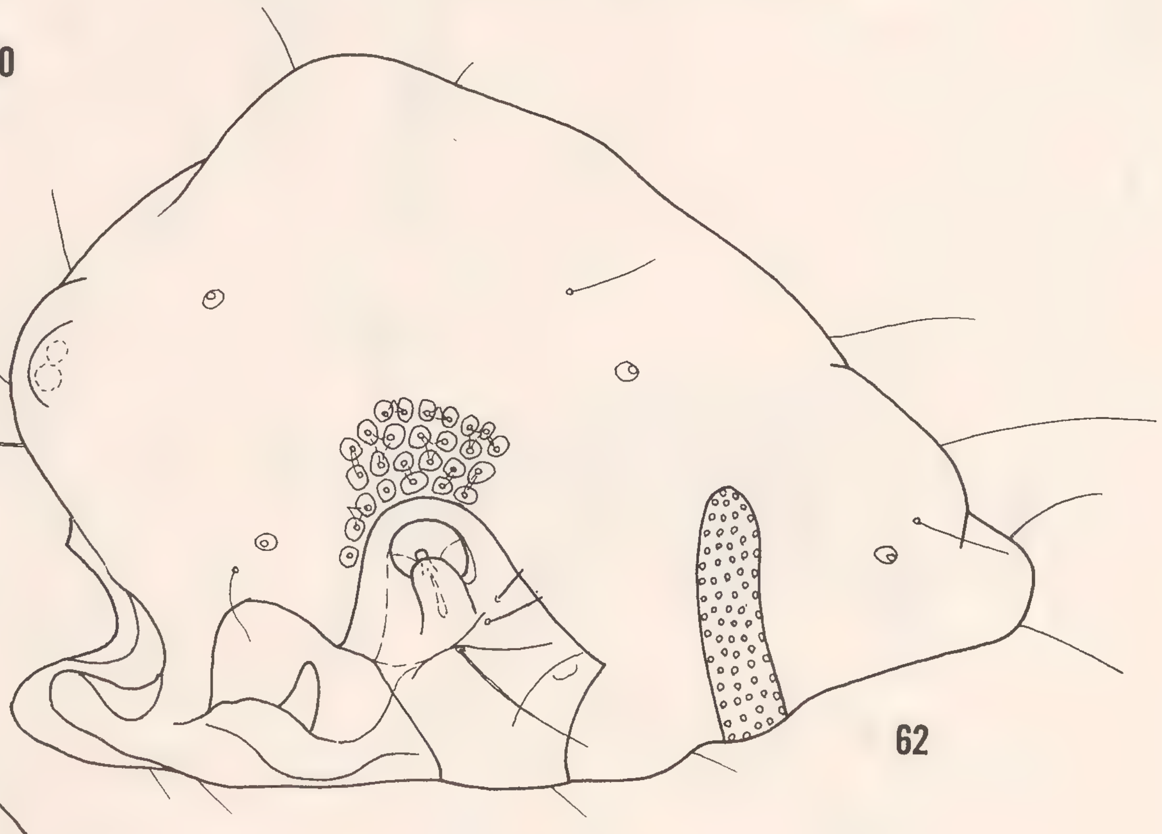
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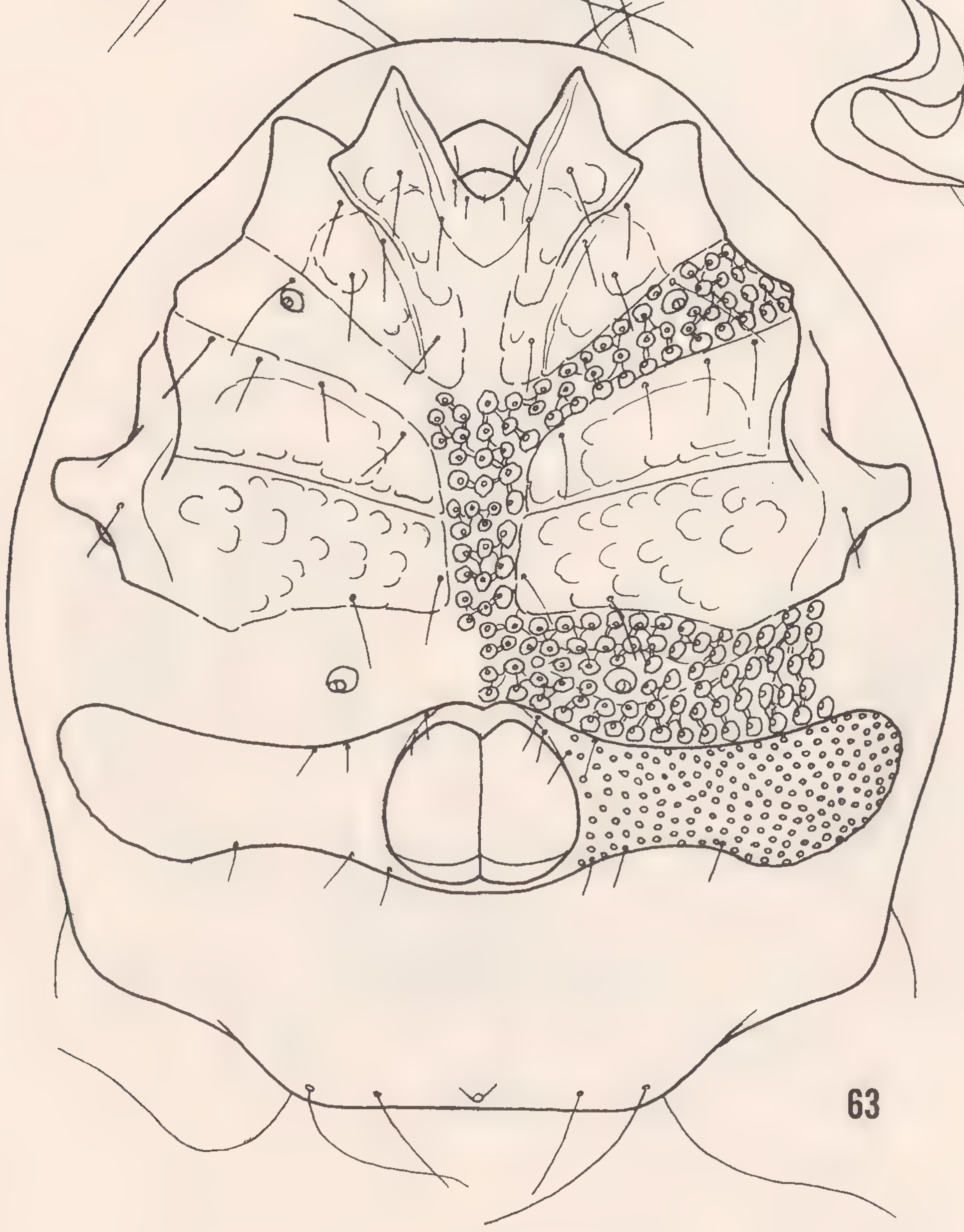
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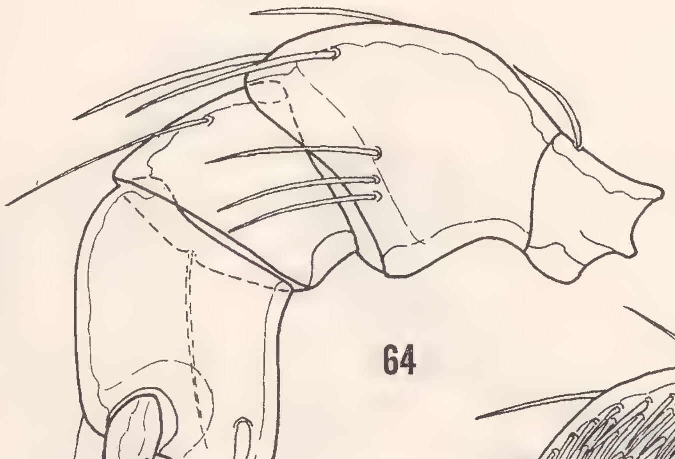
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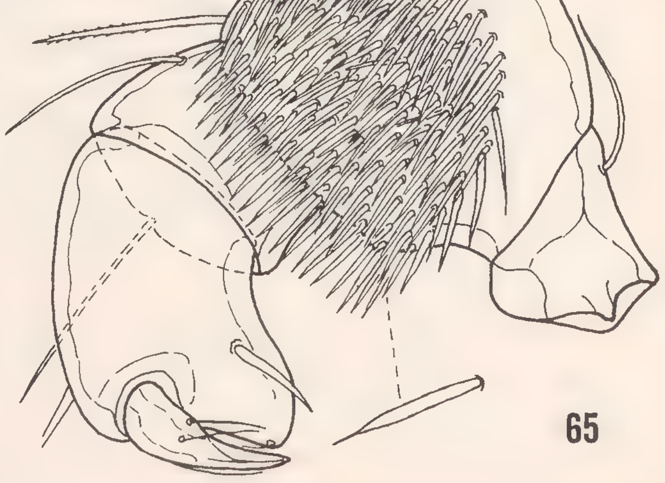
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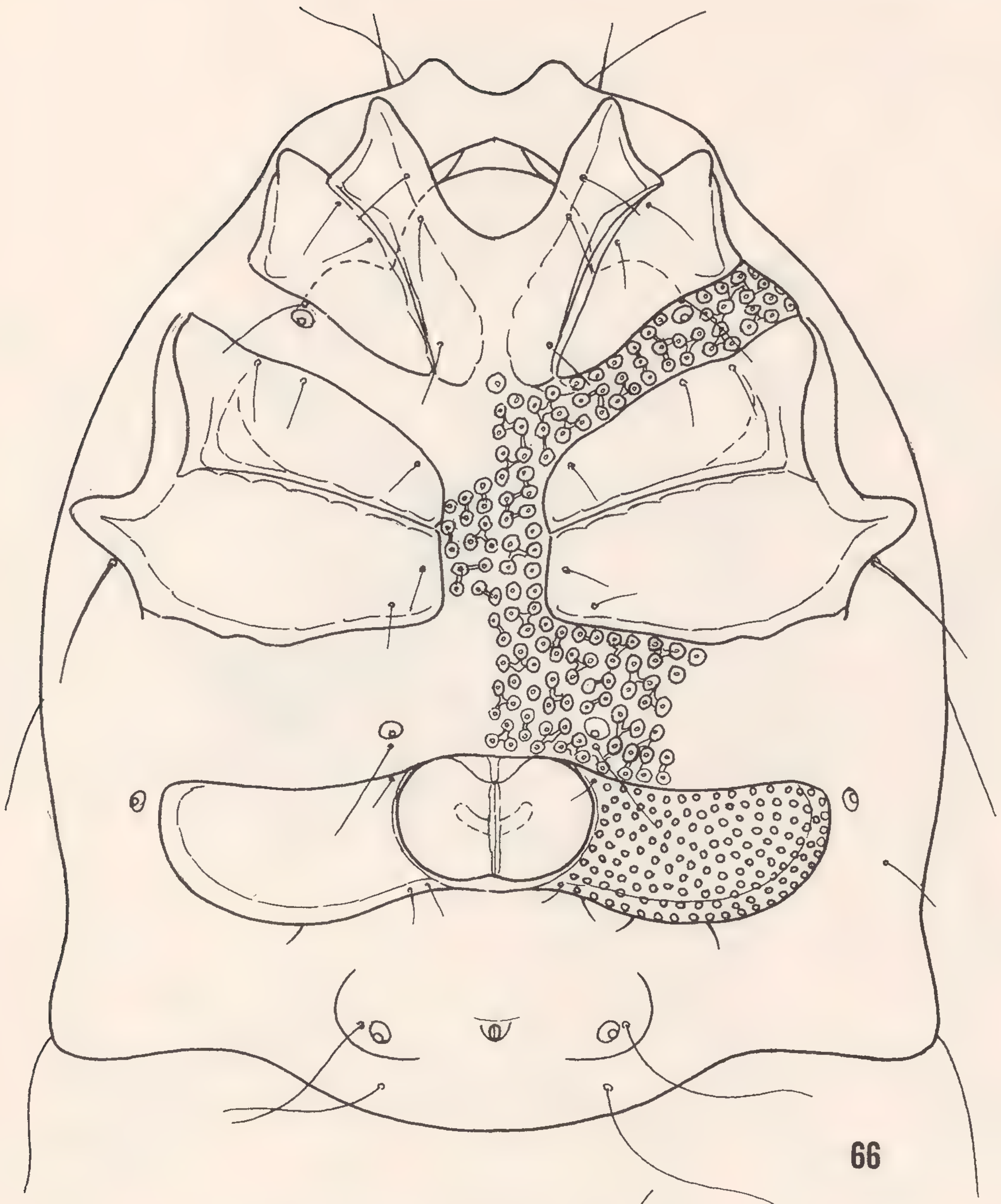
Arrenurus parasuperior n. sp. Fig. 60, dorsal view, ♂.
Arrenurus floridensis n. sp. Fig. 61, lateral view, ♂; Fig. 63, ventral view, ♀; Fig. 64, palp, ♀.
Arrenurus neocrenellatus n. sp. Fig. 62, lateral view, ♂; Fig. 65, palp, ♀.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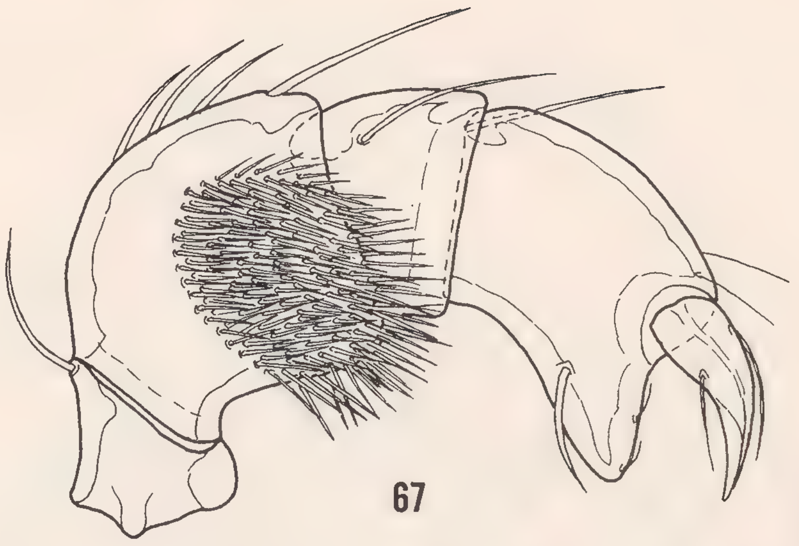
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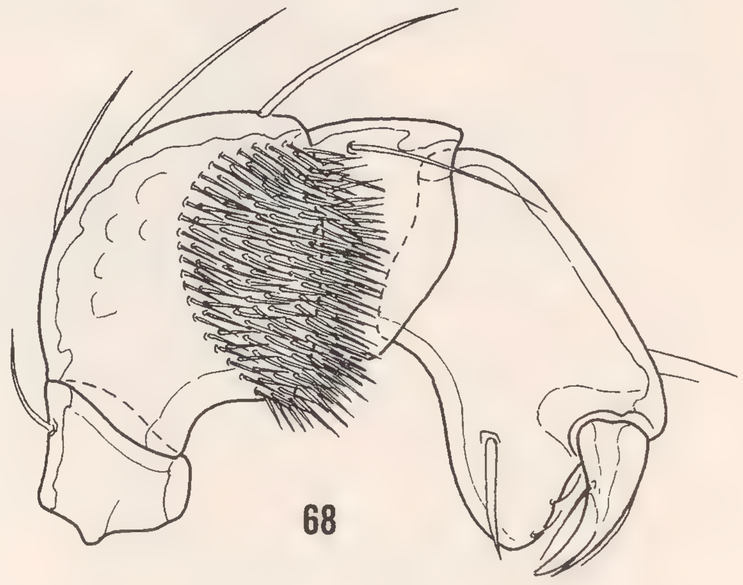
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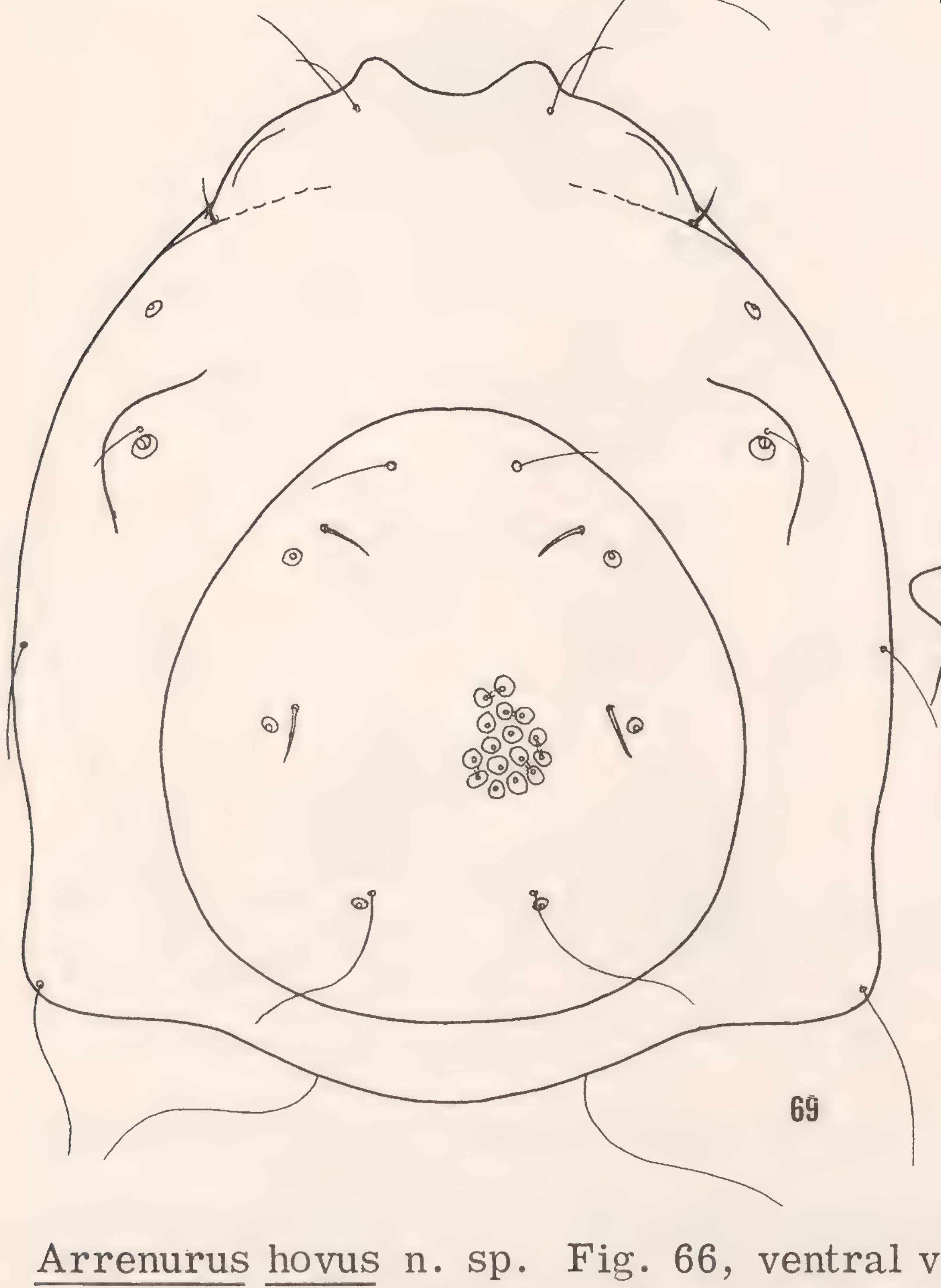
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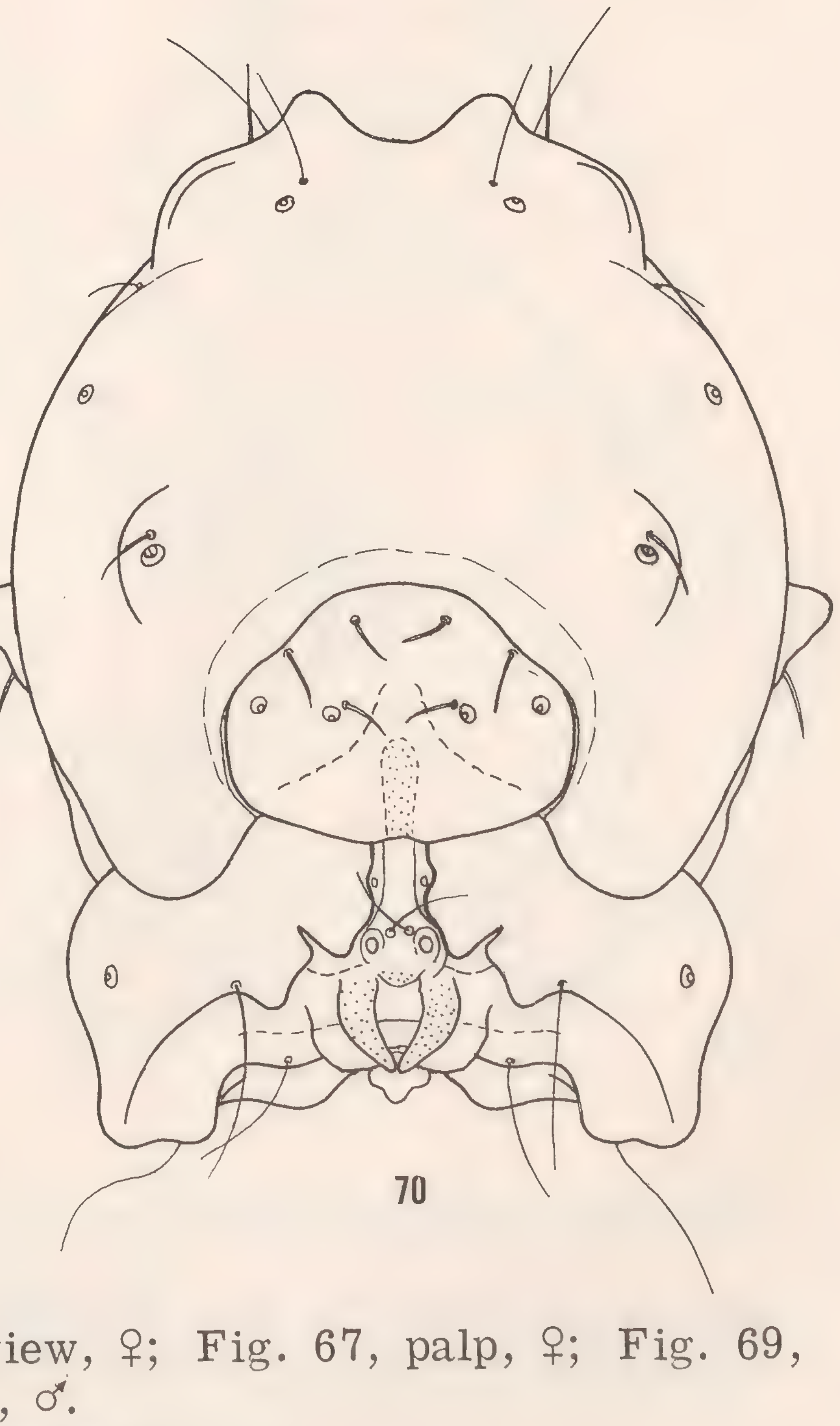
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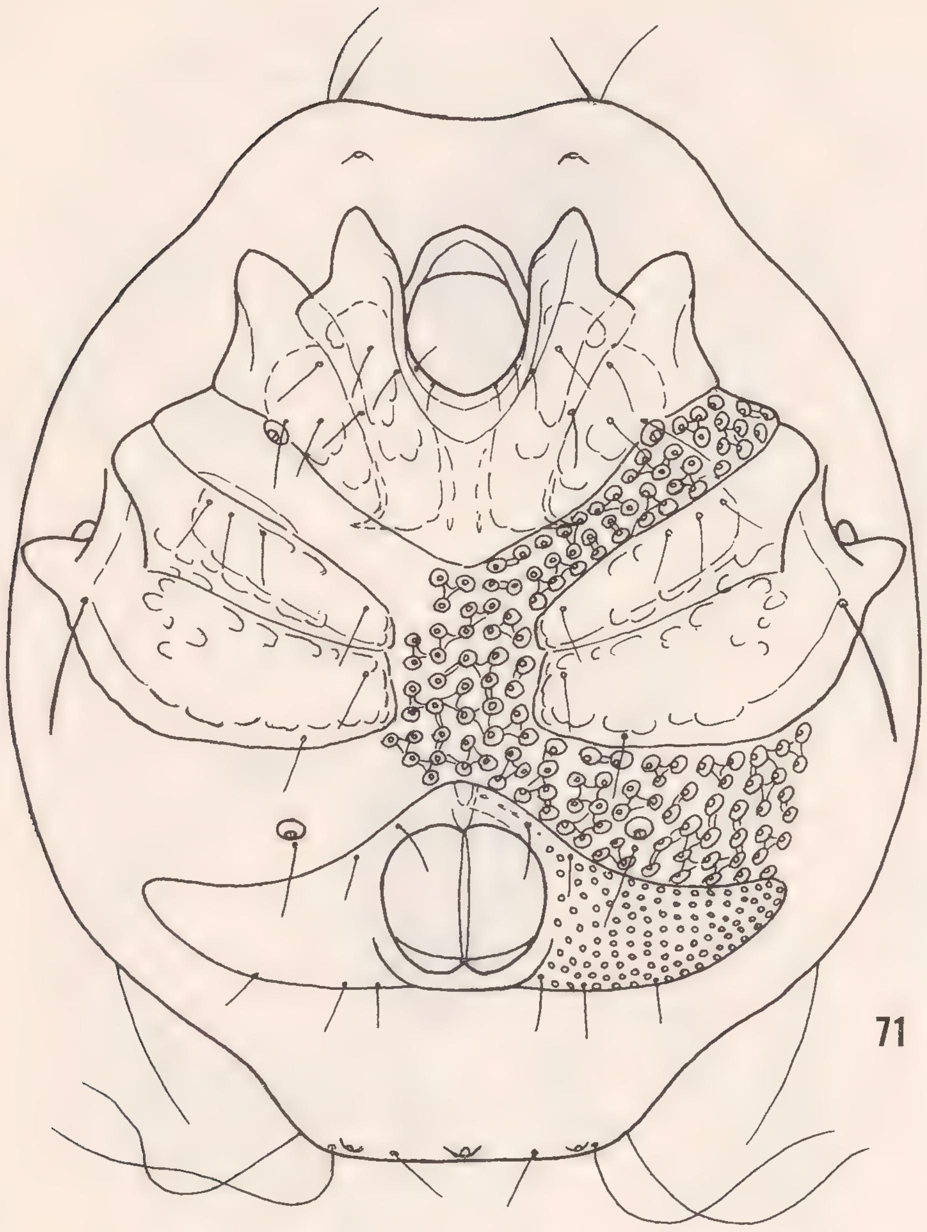
Arrenurus hovus n. sp. Fig. 66, ventral view, ♀; Fig. 67, palp, ♀; Fig. 69, dorsal view, ♀; Fig. 70, dorsal view, ♂.
Arrenurus immokaleensis n. sp. Fig. 68, palp, ♂.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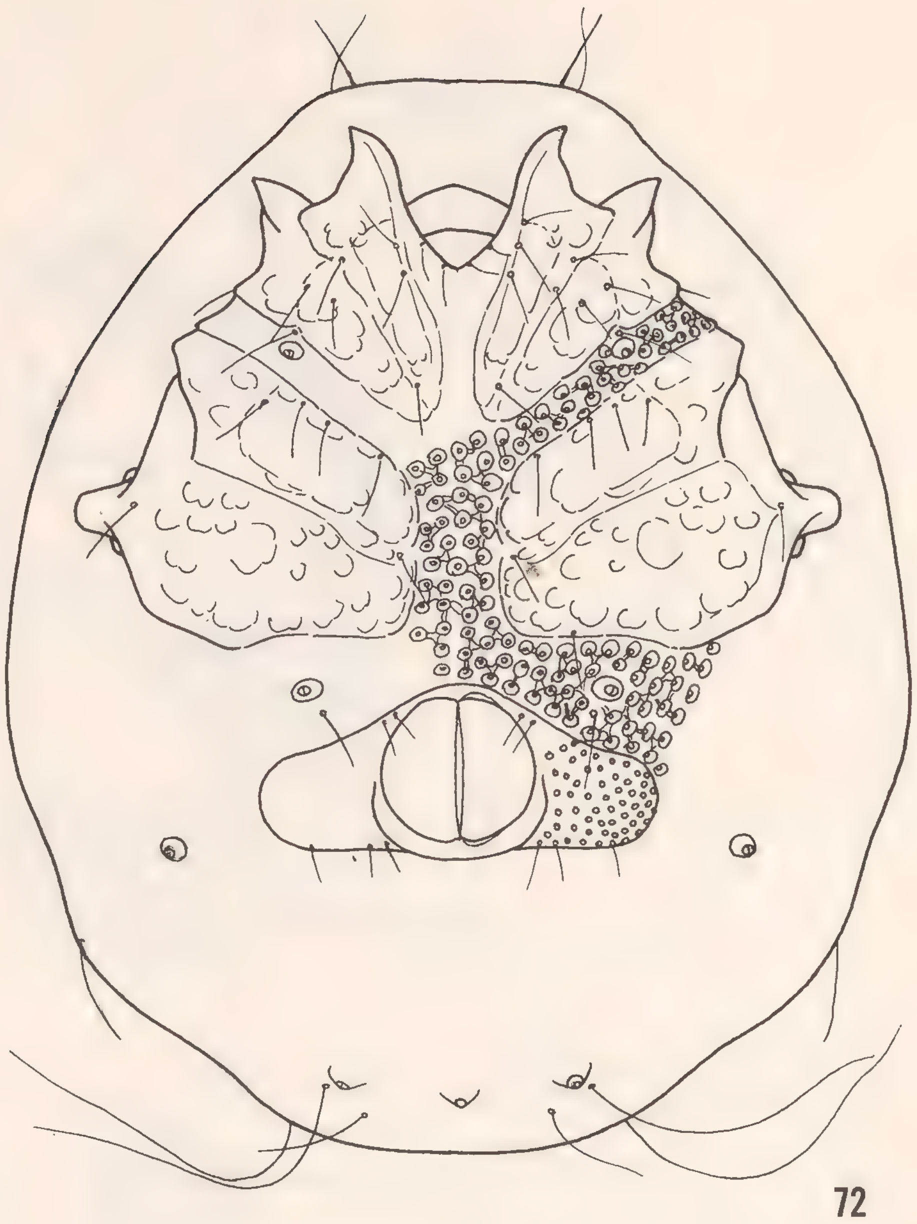
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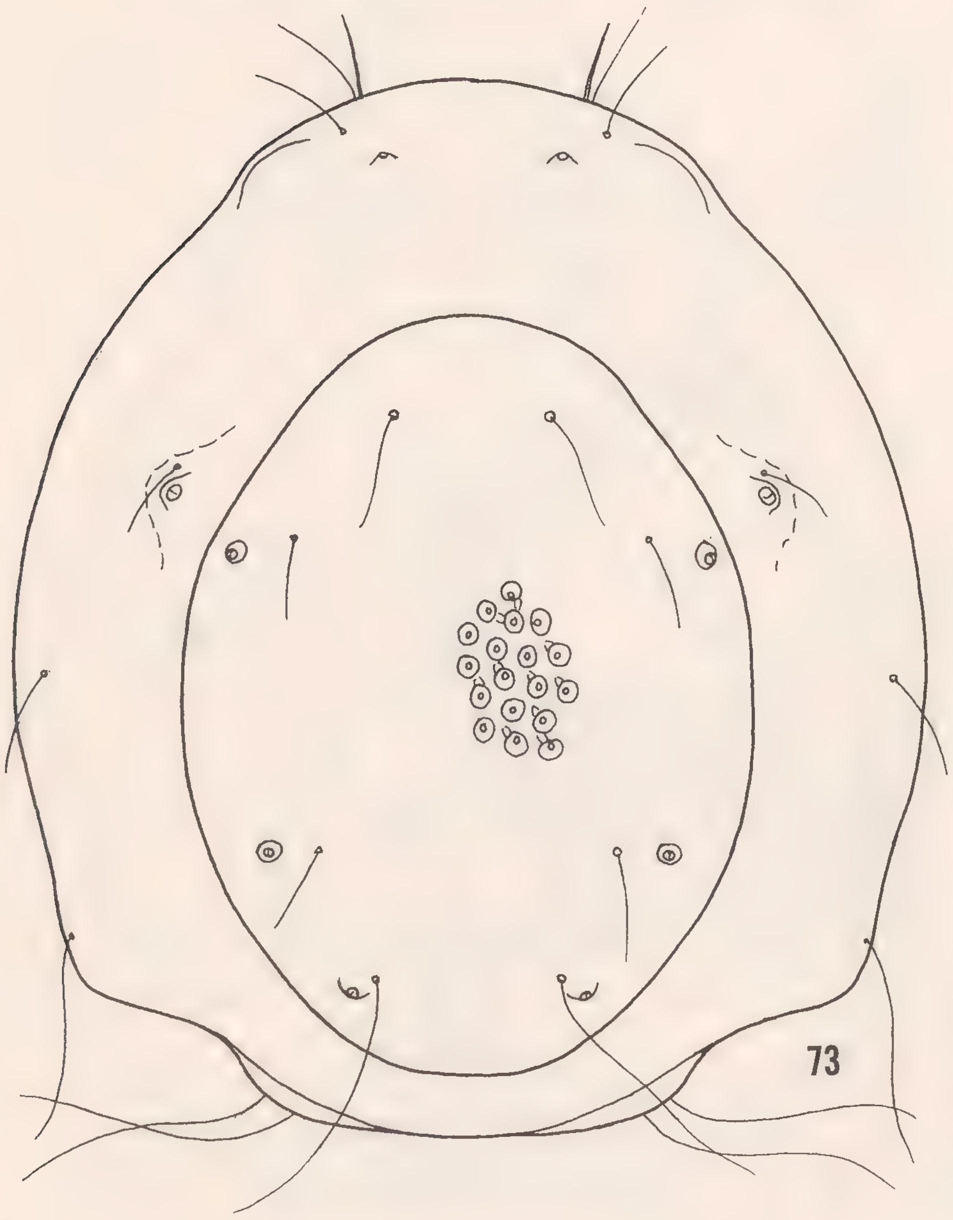
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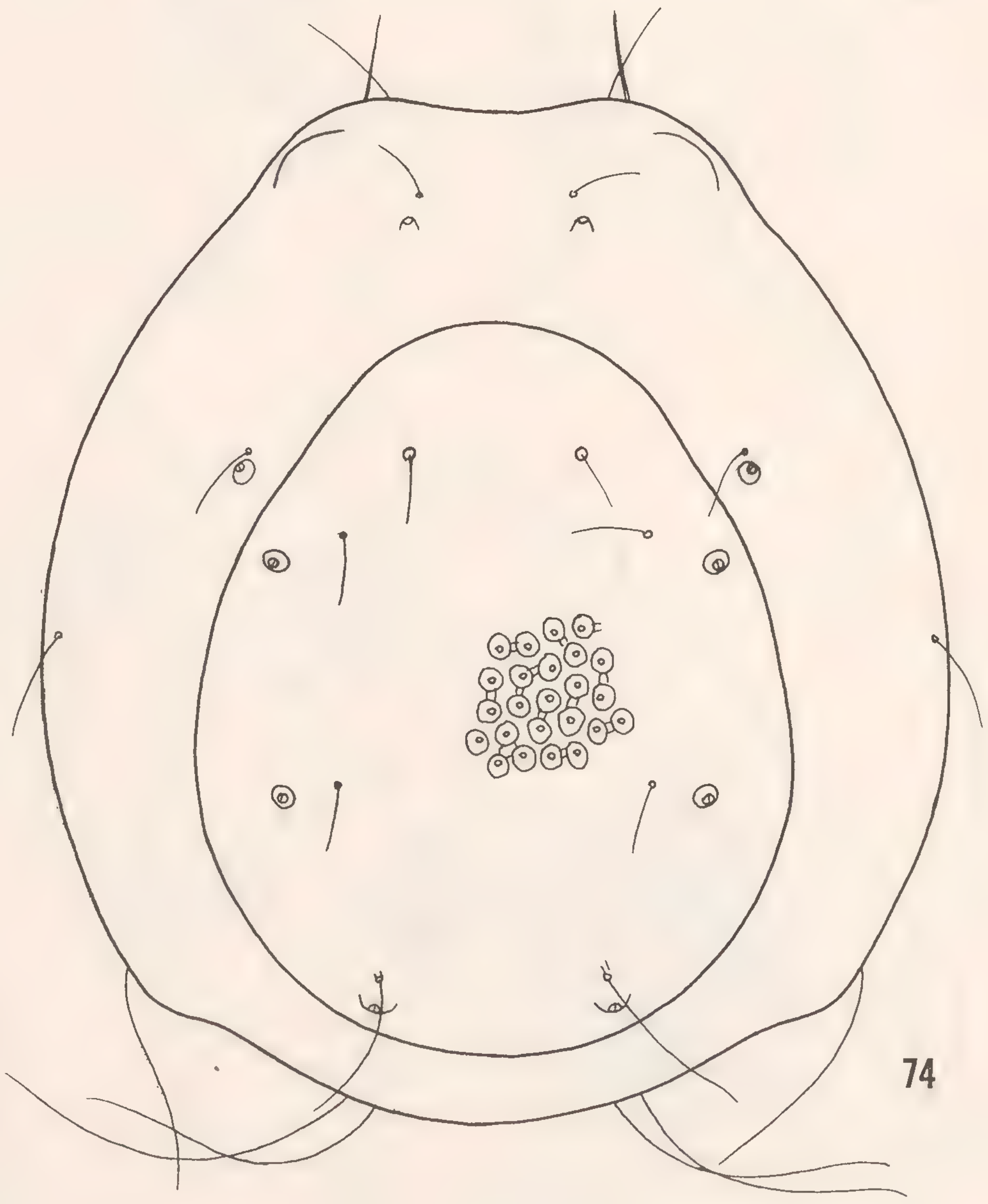
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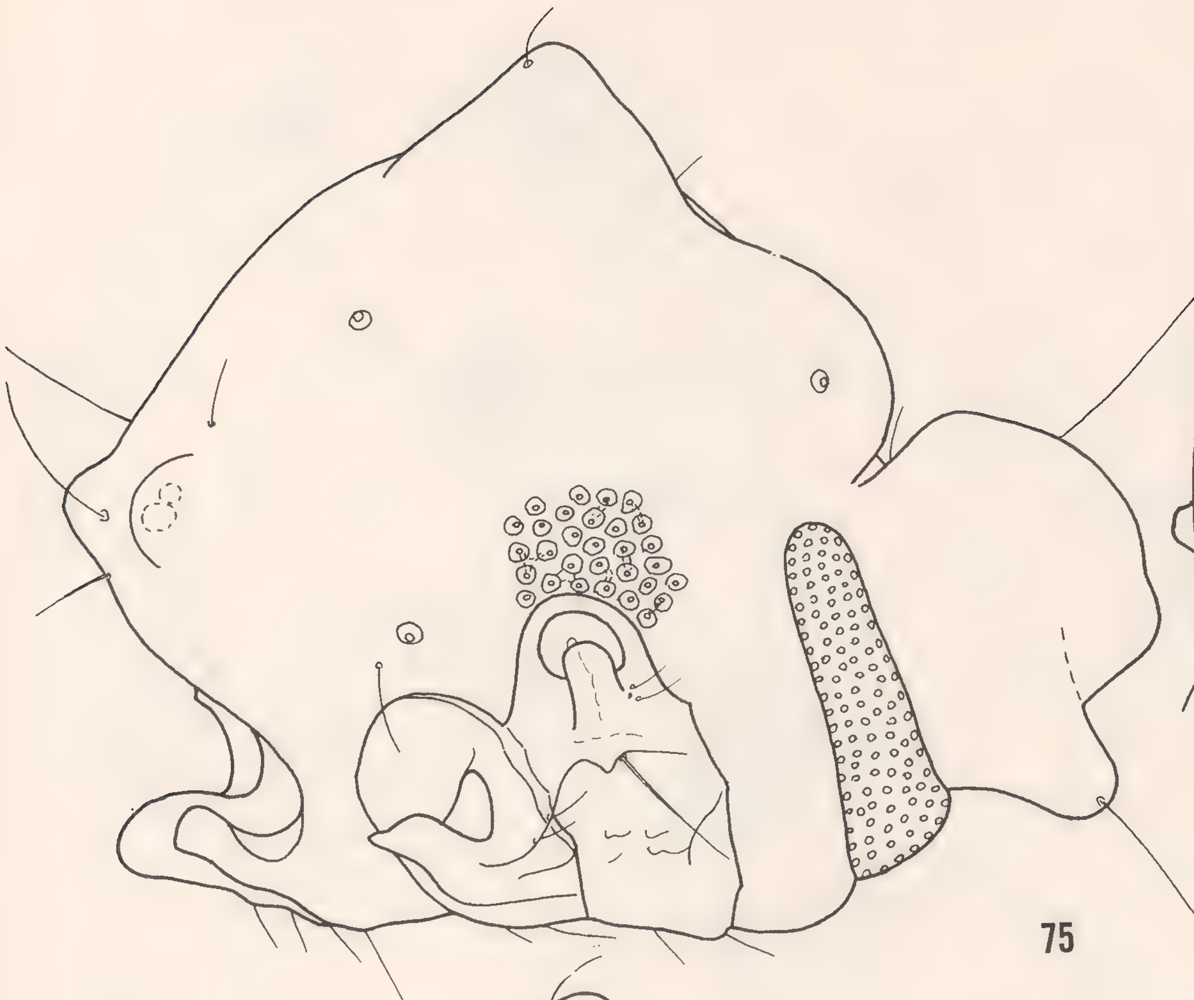
Arrenurus neocrenellatus n. sp. Fig. 71, ventral view, ♀; Fig. 74, dorsal view, ♀.
Arrenurus zorus n. sp. Fig. 72, ventral view, ♀.
Arrenurus floridensis n. sp. Fig. 73, dorsal view, ♀.



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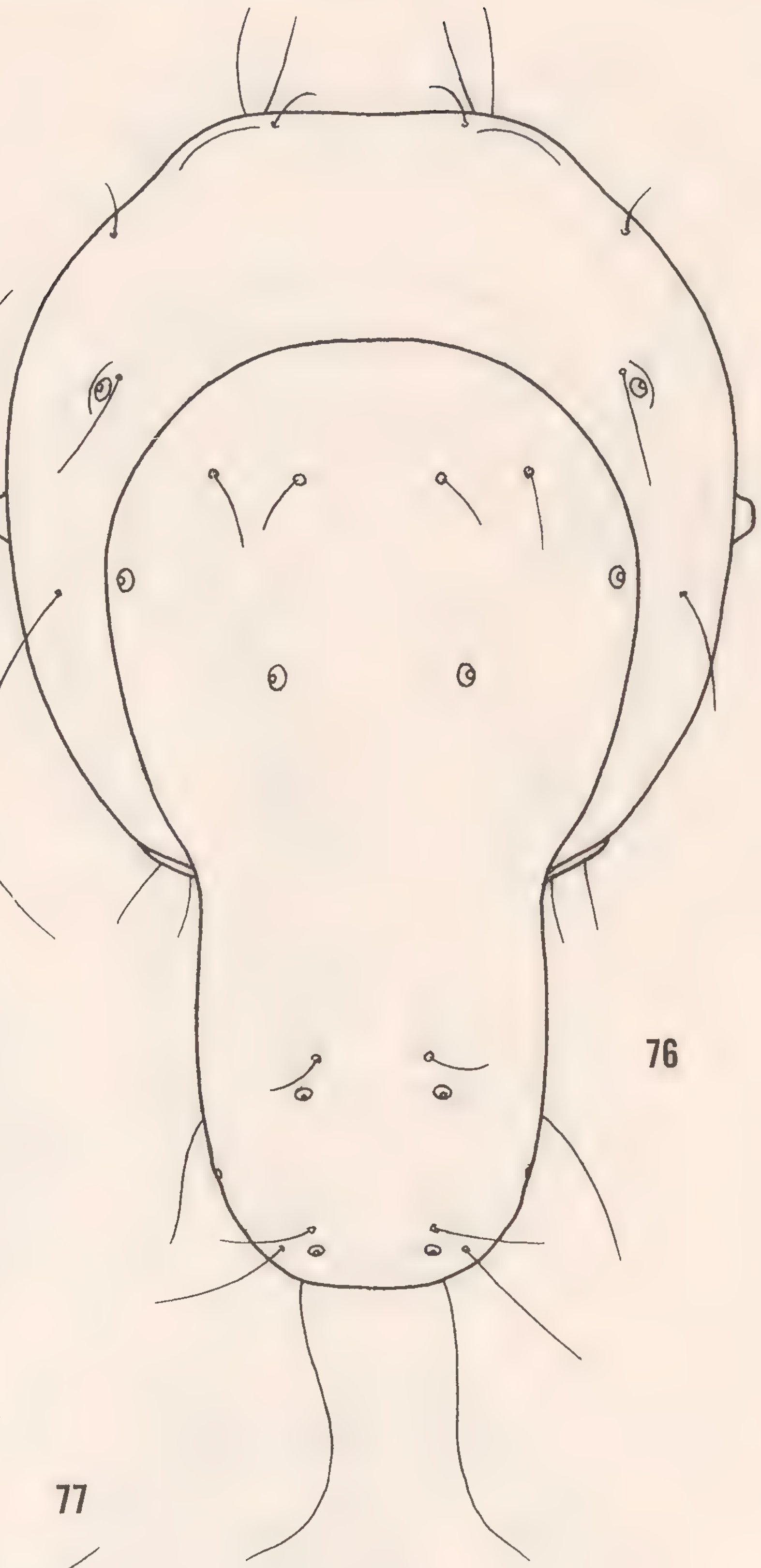

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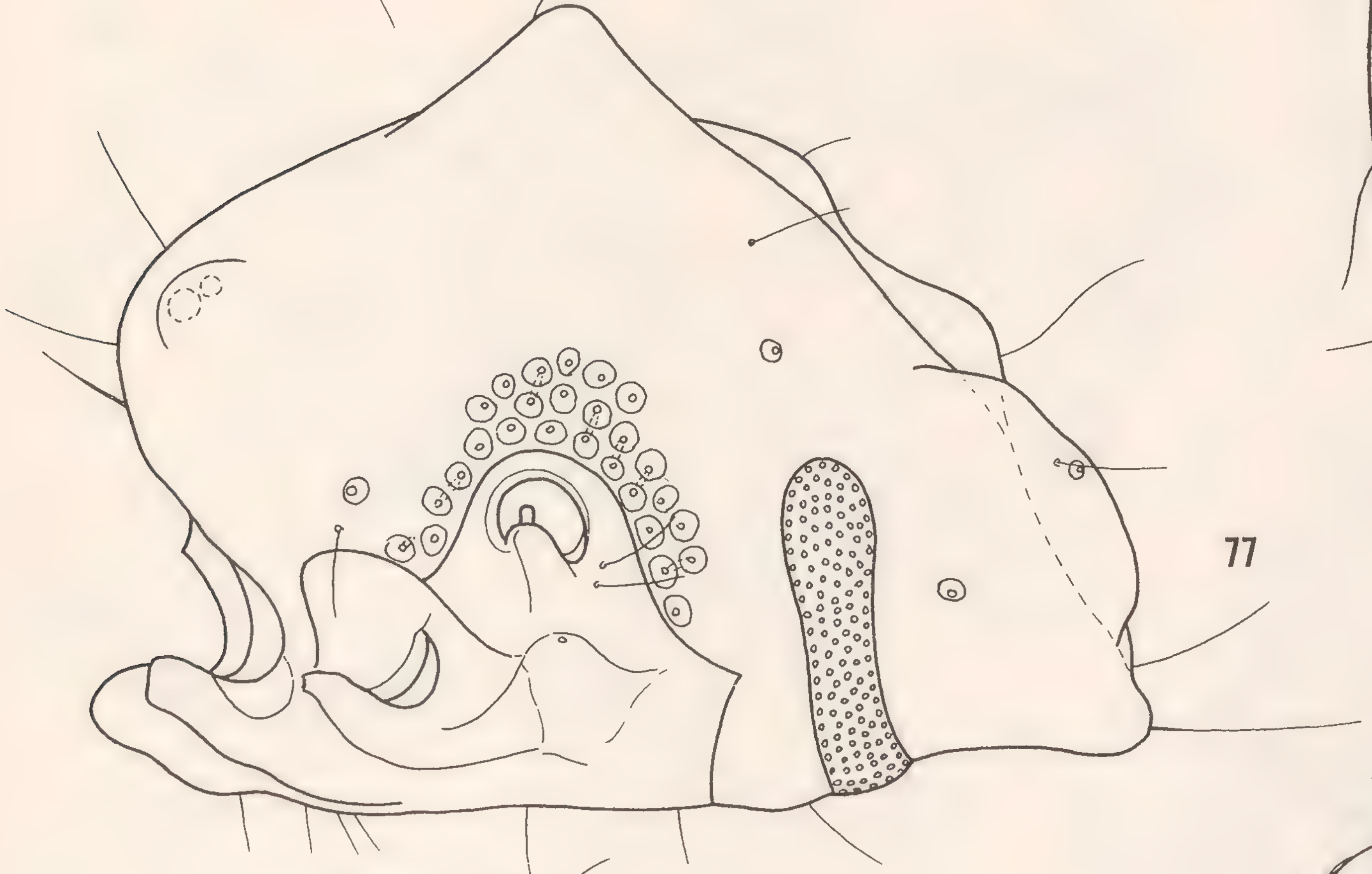

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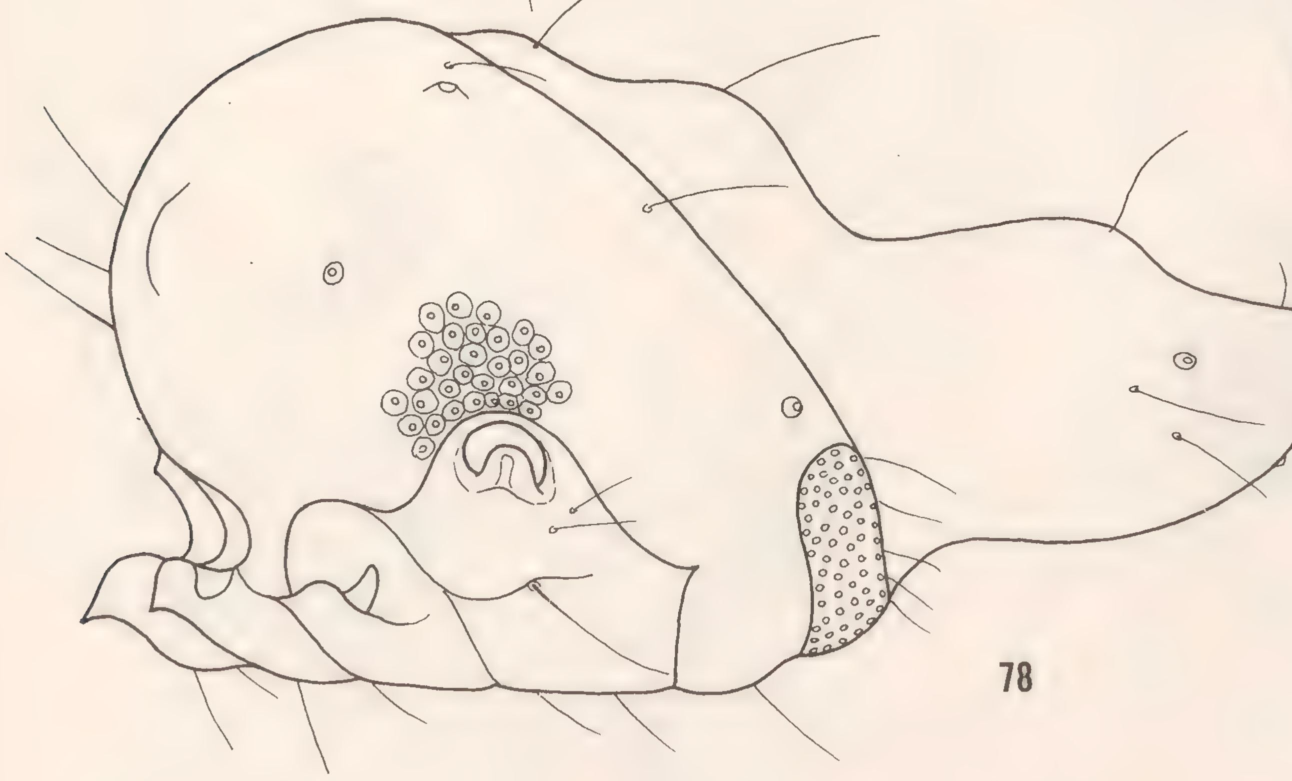

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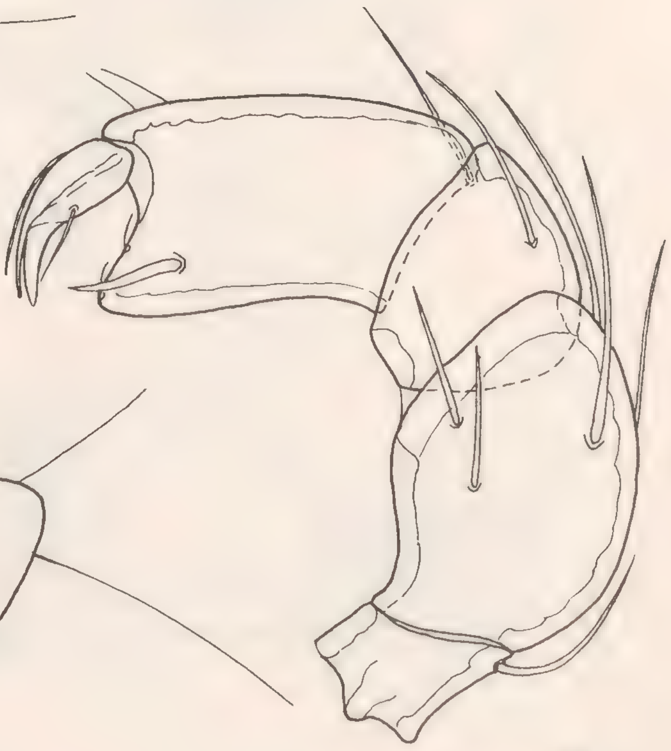
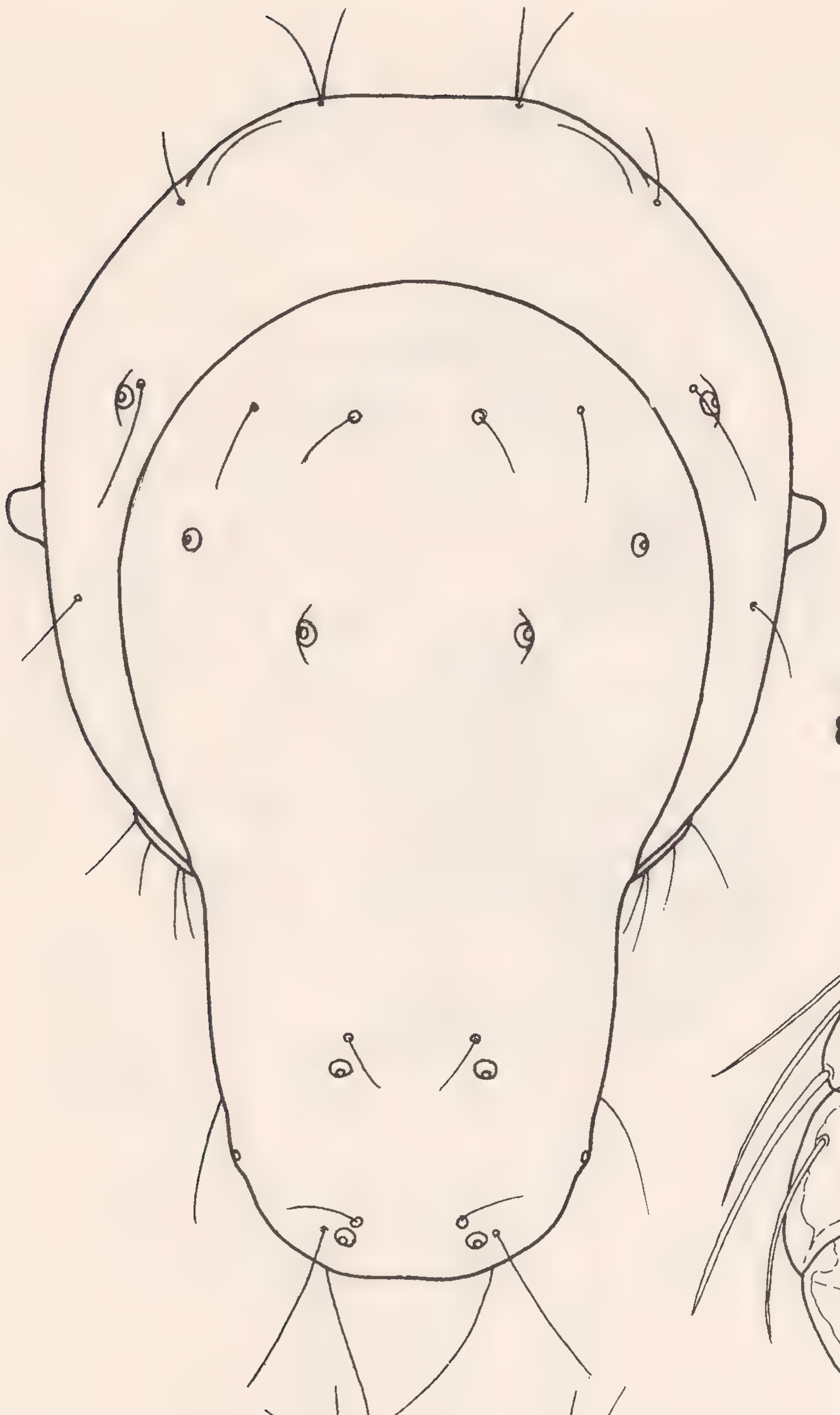


79

Arrenurus hovus n. sp. Fig. 75, lateral view, ♂.
Arrenurus veracundus n. sp. Fig. 76, dorsal view, ♂; Fig. 78, lateral view, ♂; Fig. 79, palp, ♂.
Arrenurus immokaleensis n. sp. Fig. 77, lateral view, ♂.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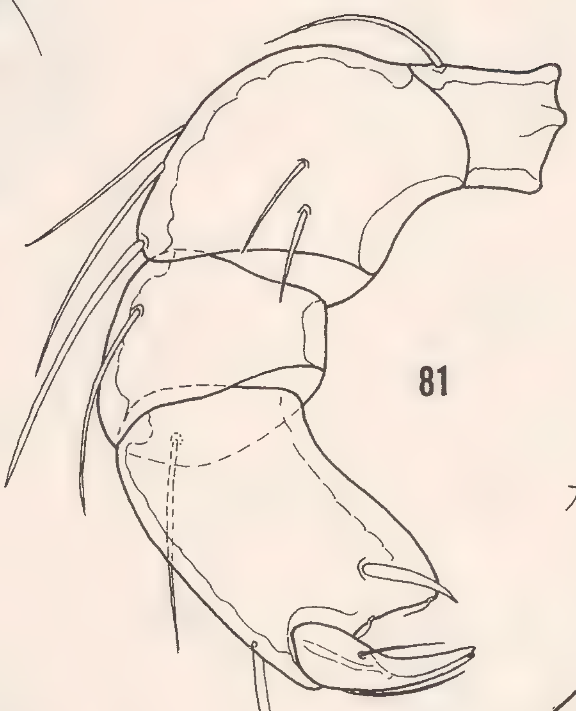
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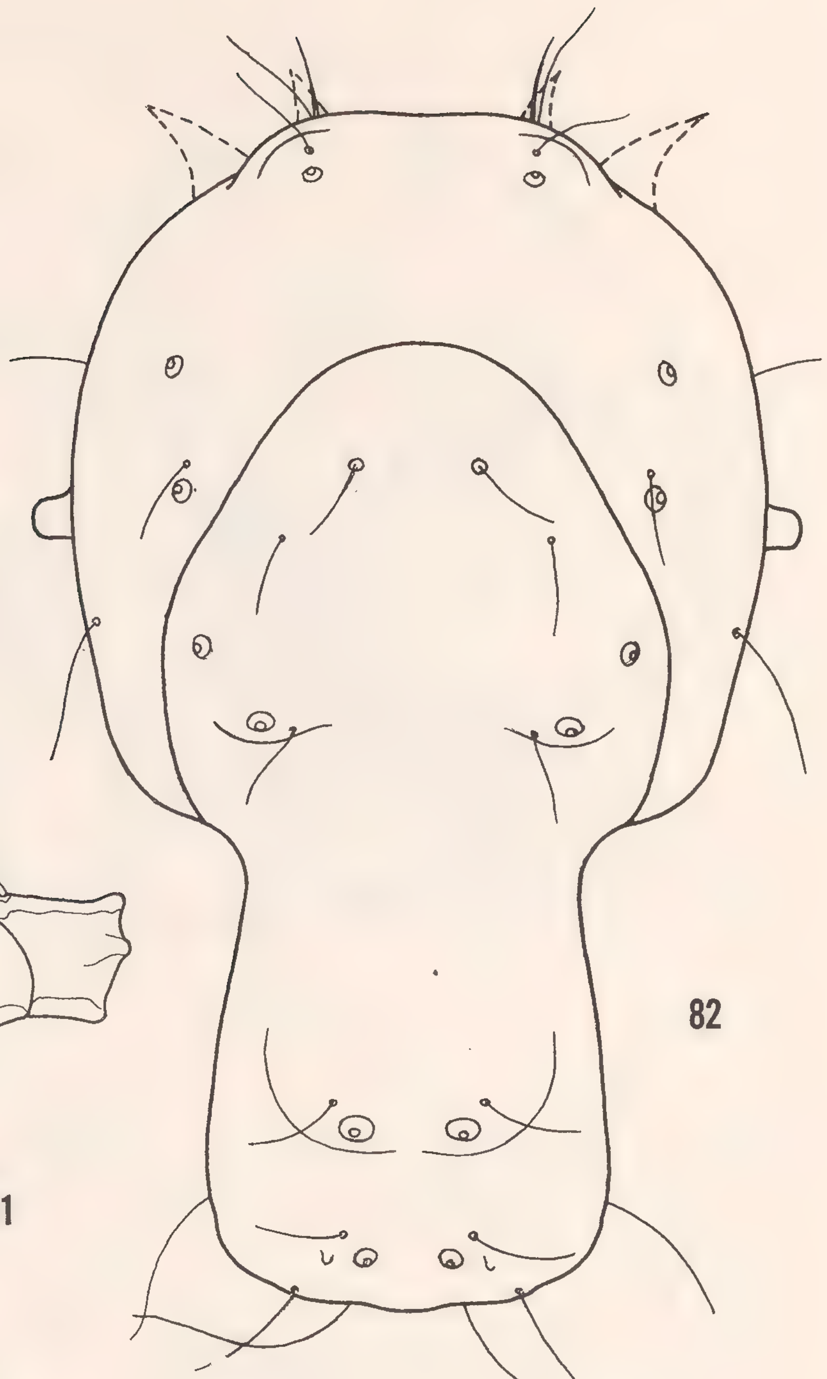
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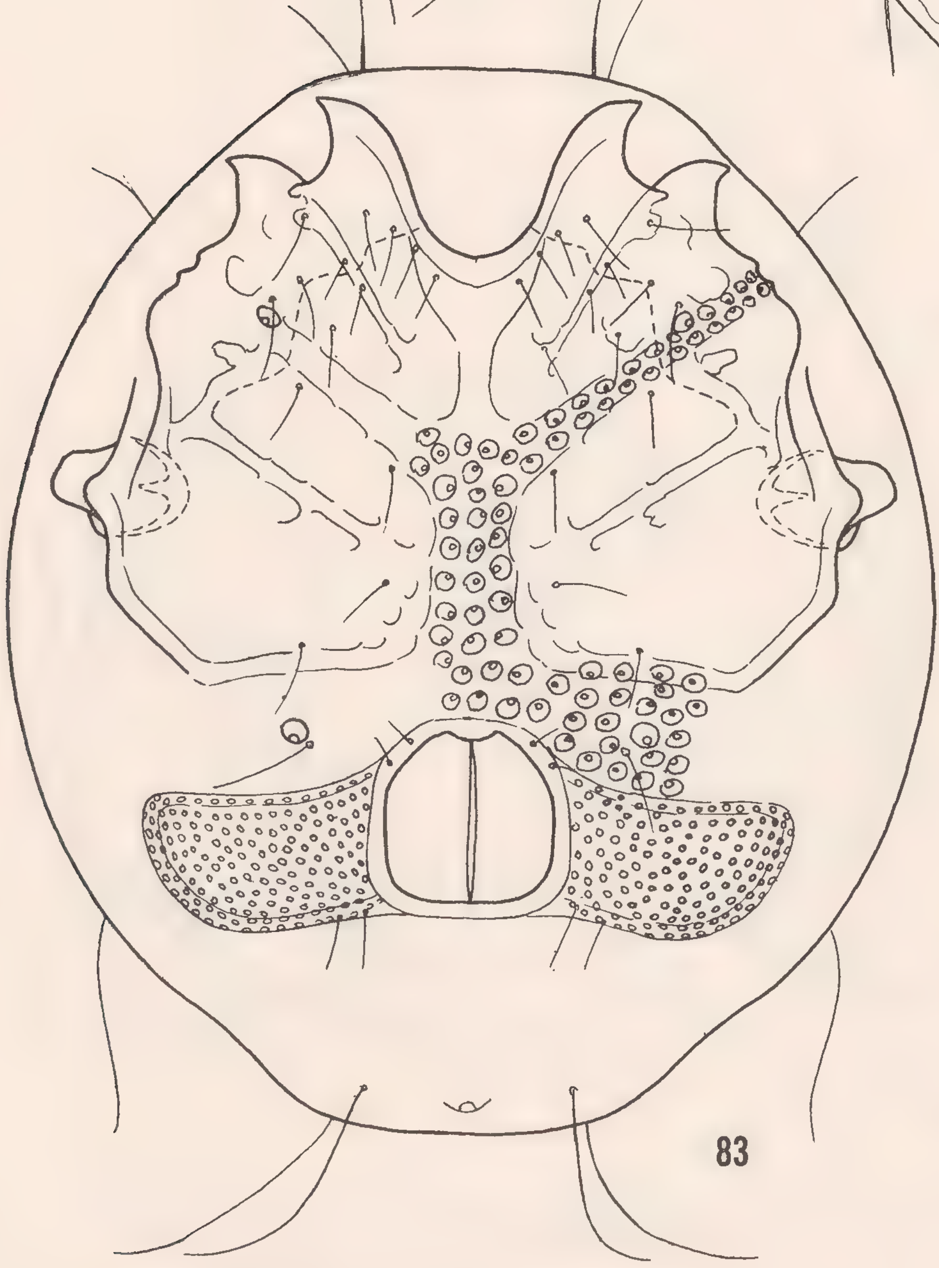
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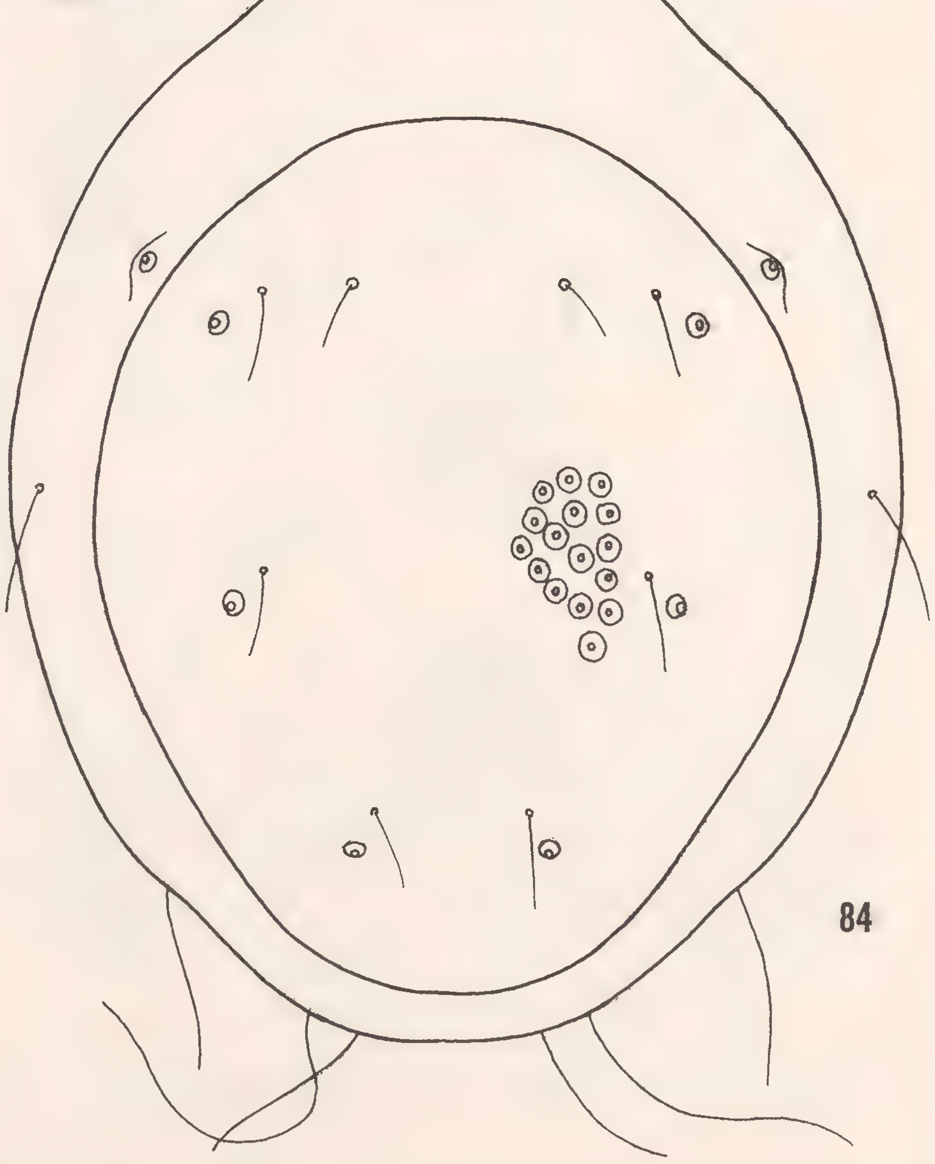
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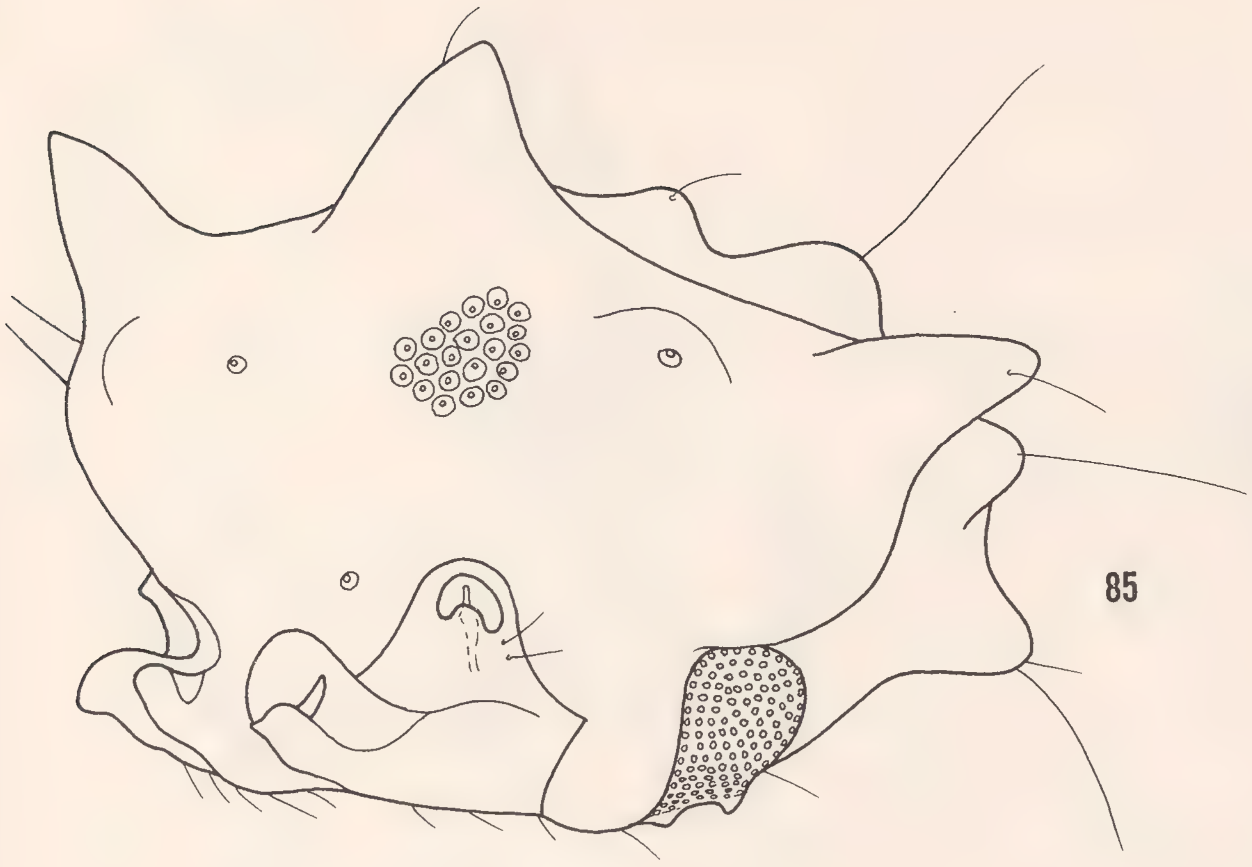
Arrenurus succissus n. sp. Fig. 80, dorsal view, ♂; Fig. 81, palp, ♂.
Arrenurus zorus n. sp. Fig. 82, dorsal view, ♂.
Arrenurus veracundus n. sp. Fig. 83, ventral view, ♀; Fig. 84, dorsal view, ♀.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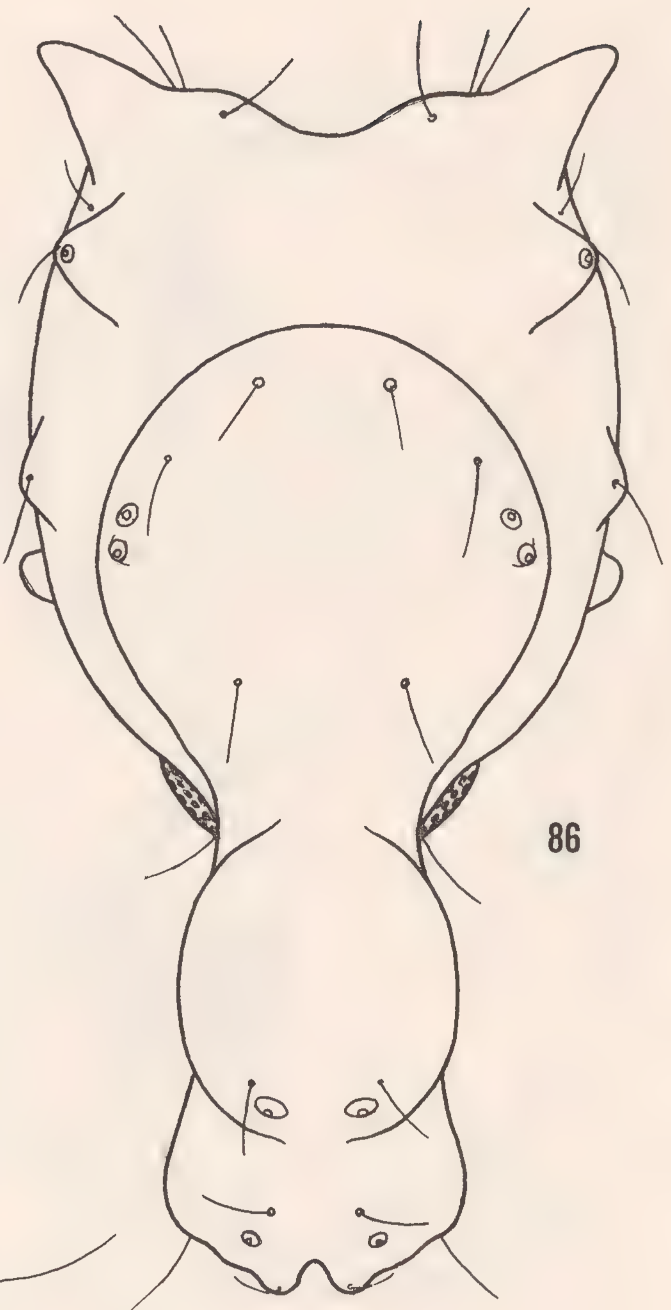
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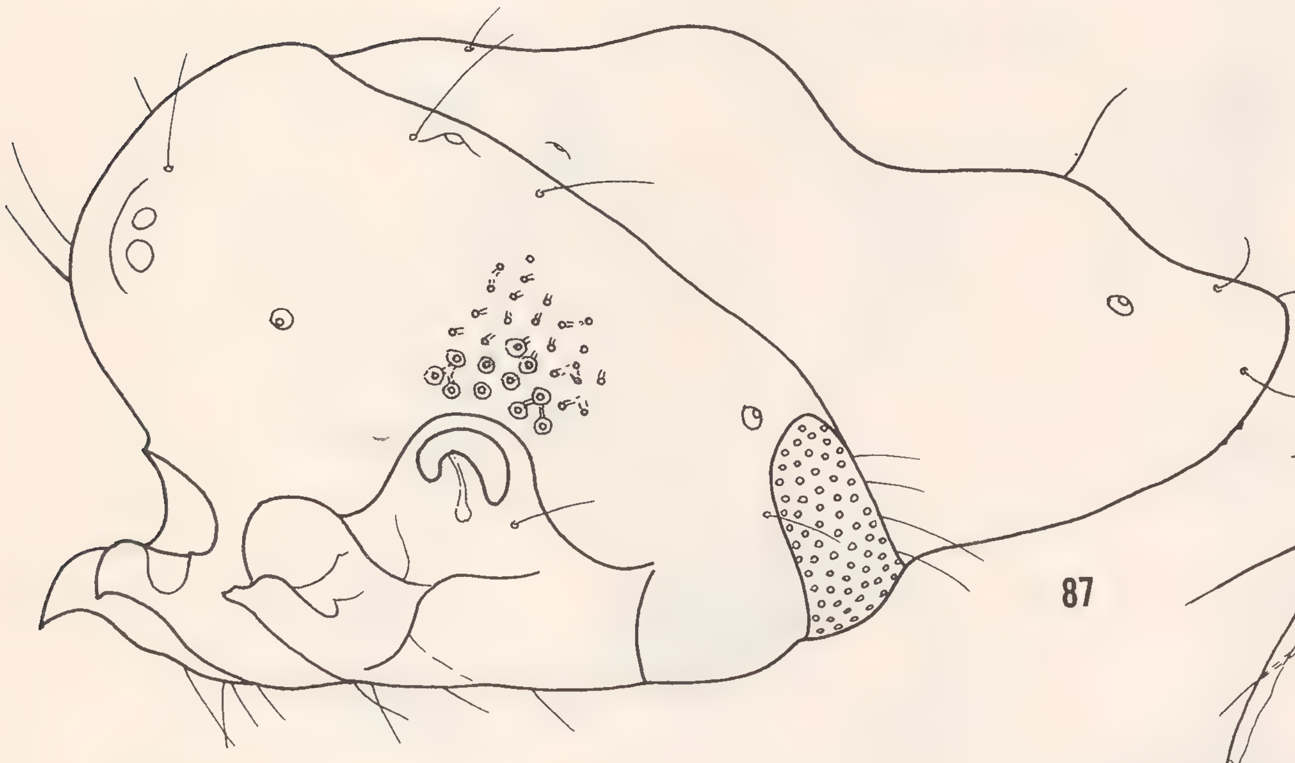
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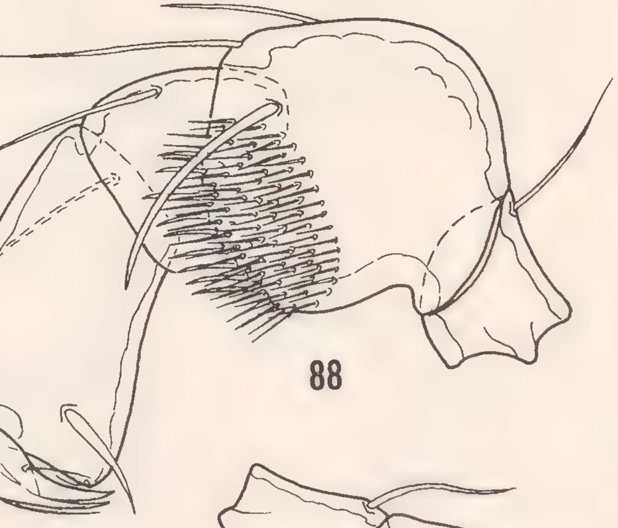
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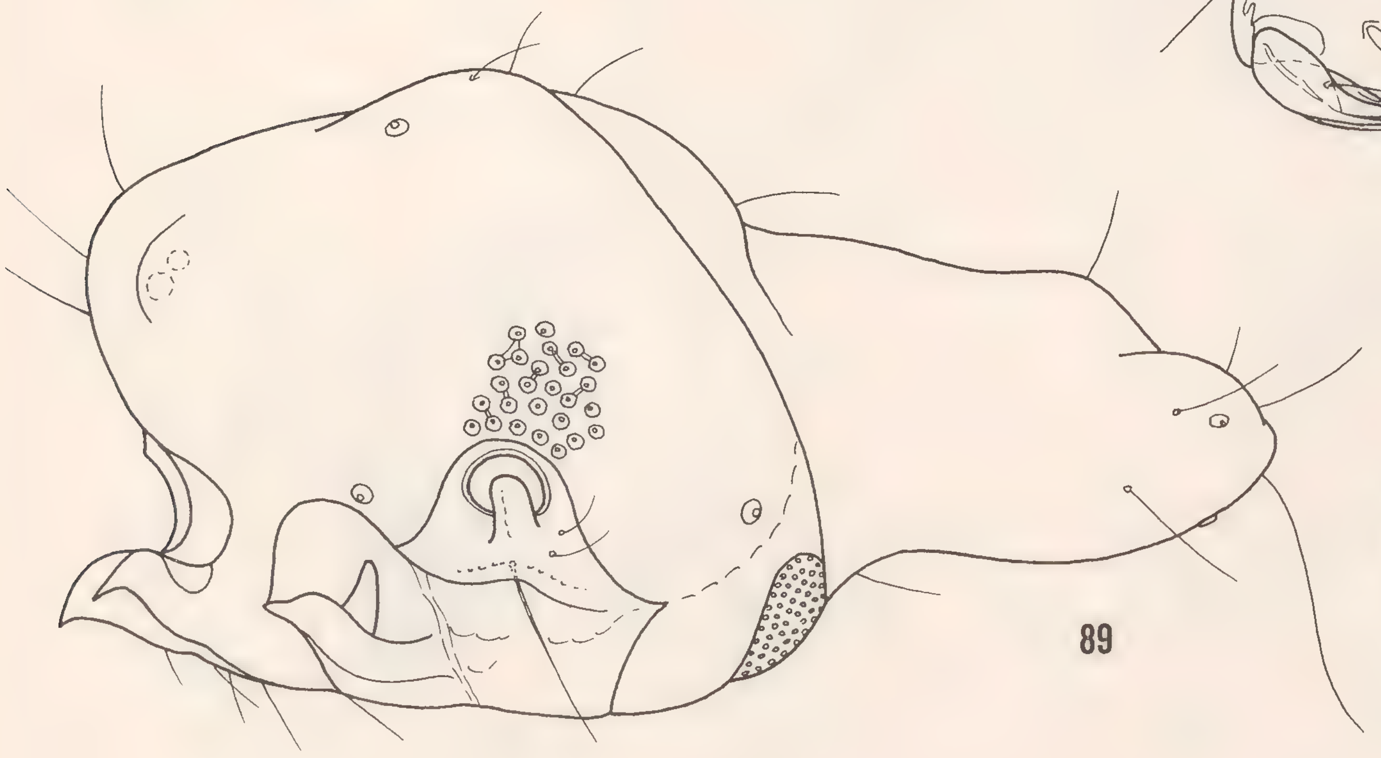
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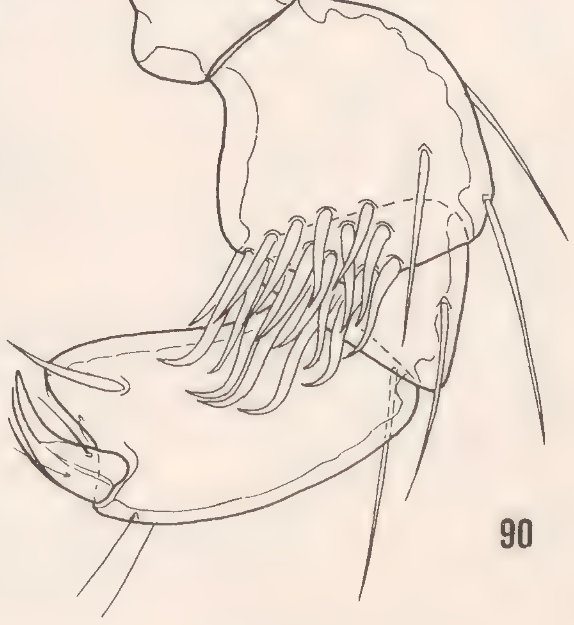
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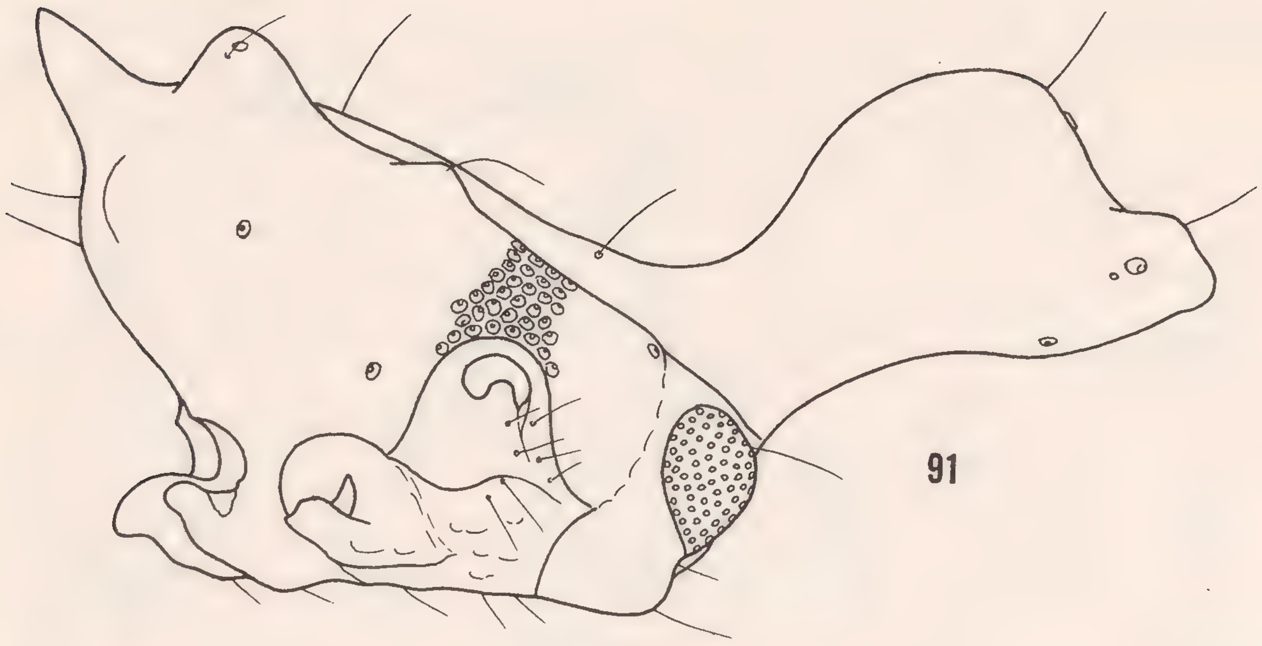
<ins>Arrenurus</ins> <ins>problecornis</ins> n. sp. Fig. 85, lateral view, ♀; Fig. 86, dorsal view, ♂; Fig. 88, palp, ♂.
<ins>Arrenurus</ins> <ins>succissus</ins> n. sp. Fig. 87, lateral view, ♂.
<ins>Arrenurus</ins> <ins>zorus</ins> n. sp. Fig. 89, lateral view, ♂; Fig. 90, palp, ♂.



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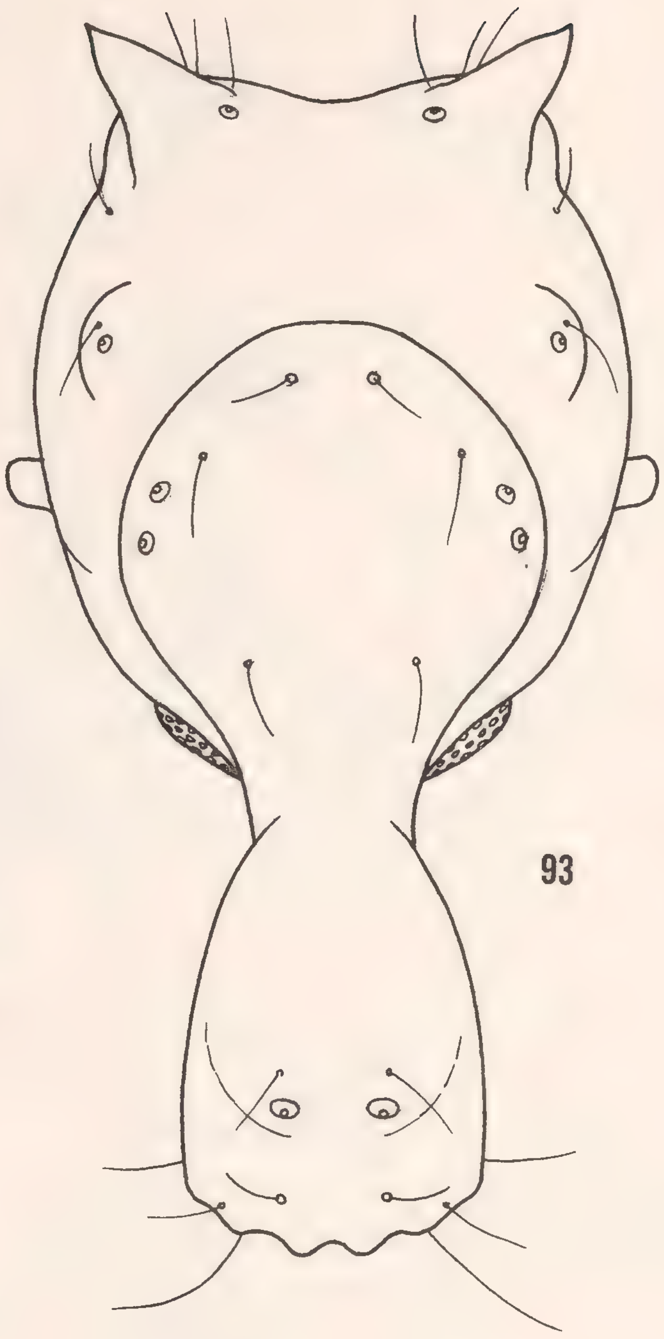

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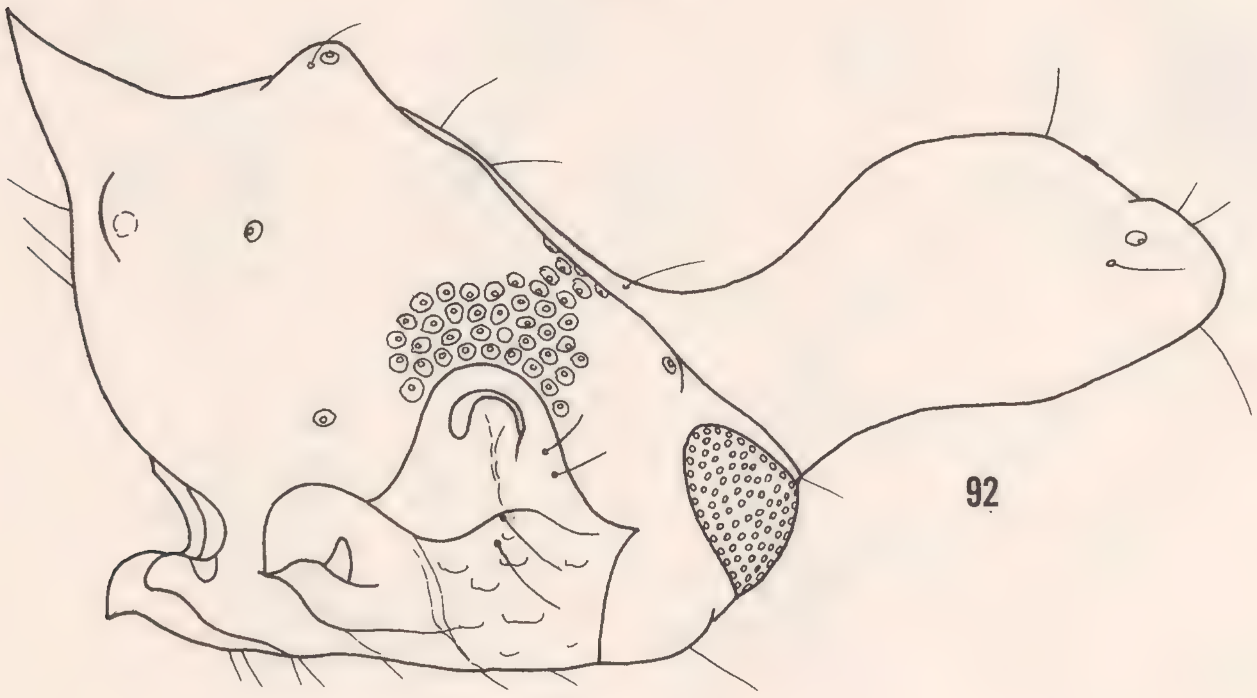

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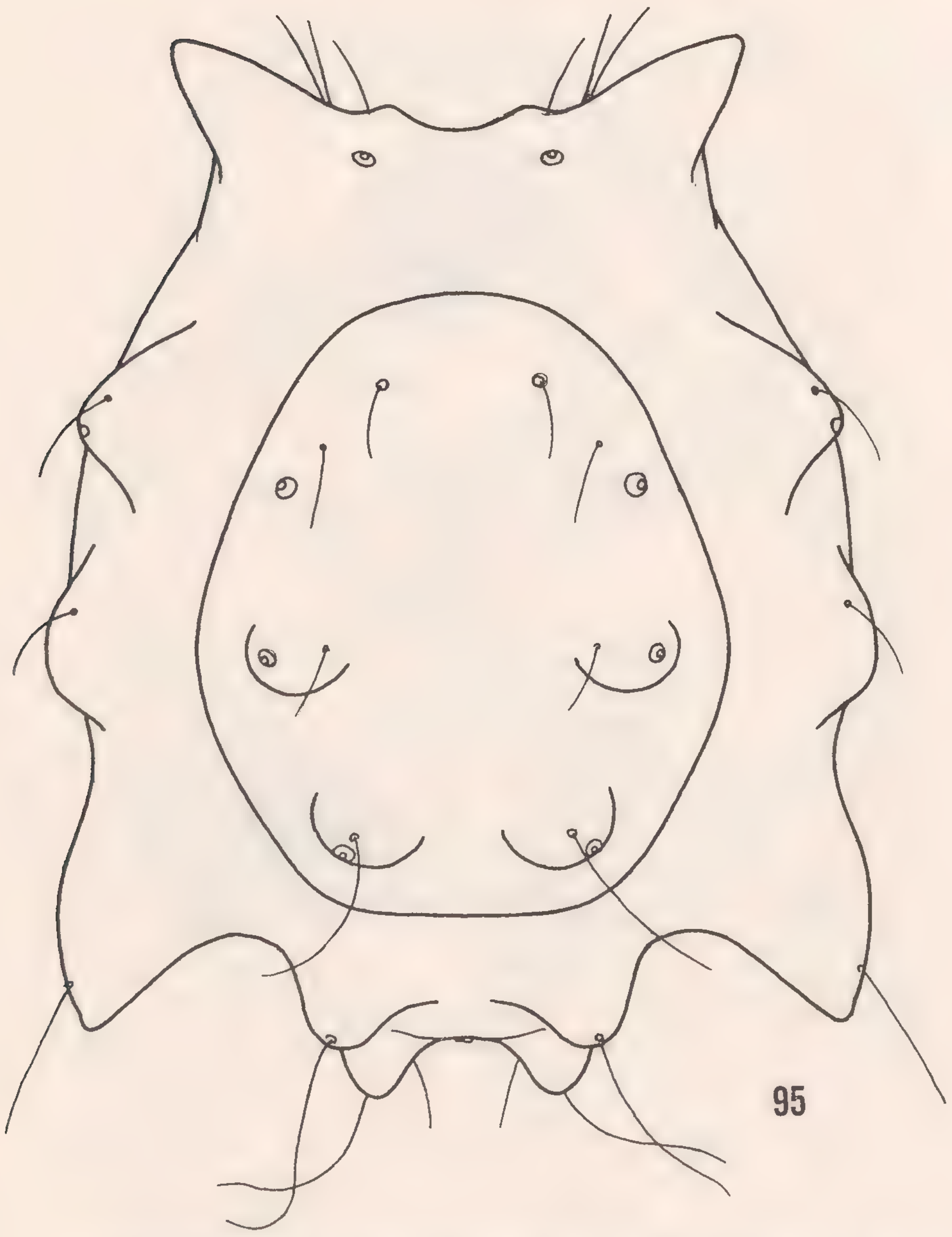

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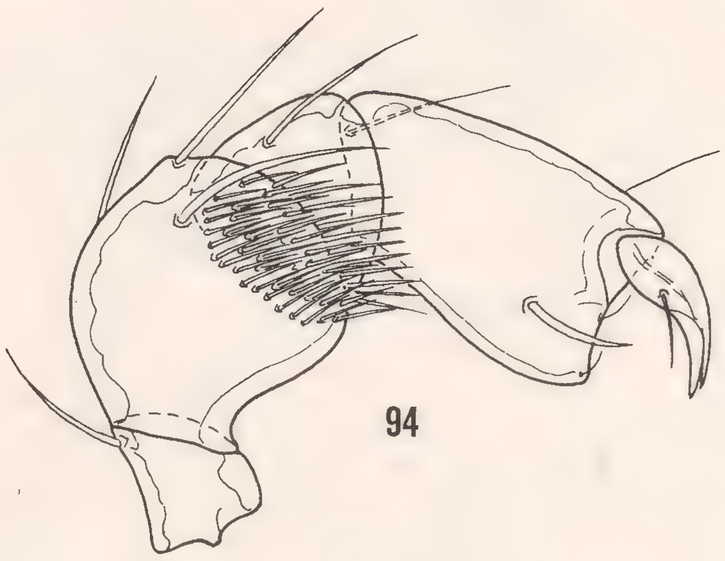

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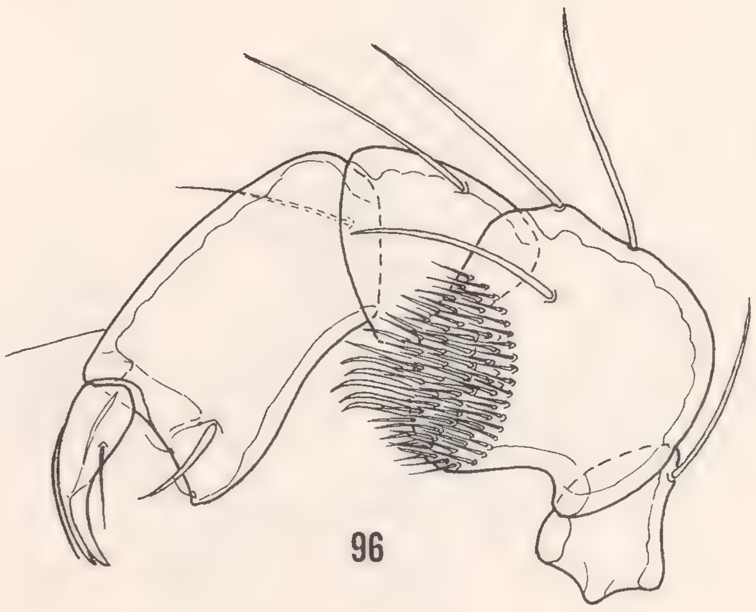
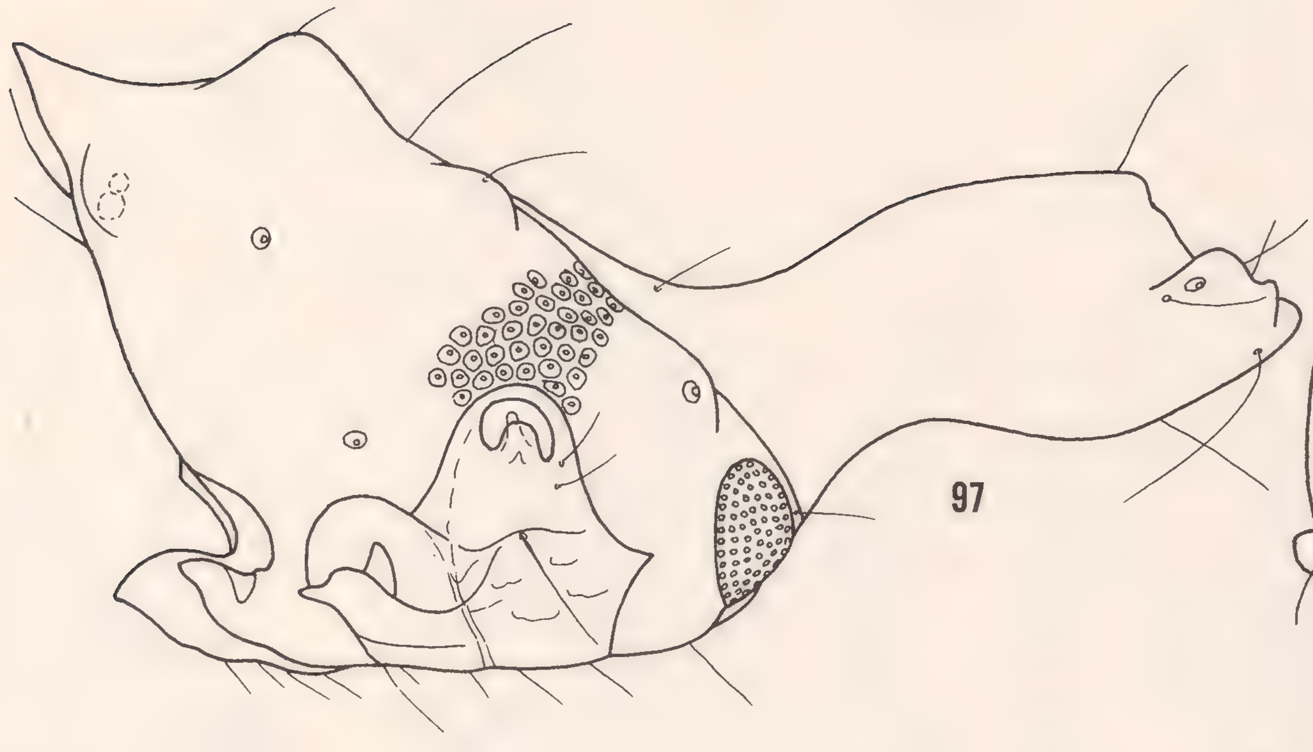


96

Arrenurus problecornis n. sp. Fig. 91, lateral view, ♂; Fig. 95, dorsal view, ♀.

Arrenurus sp. Fig. 92, lateral view, ♂; Fig. 93, dorsal view, ♂; Fig. 94, palp, ♂.

Arrenurus prodromocornis n. sp. Fig. 96, palp, ♂.



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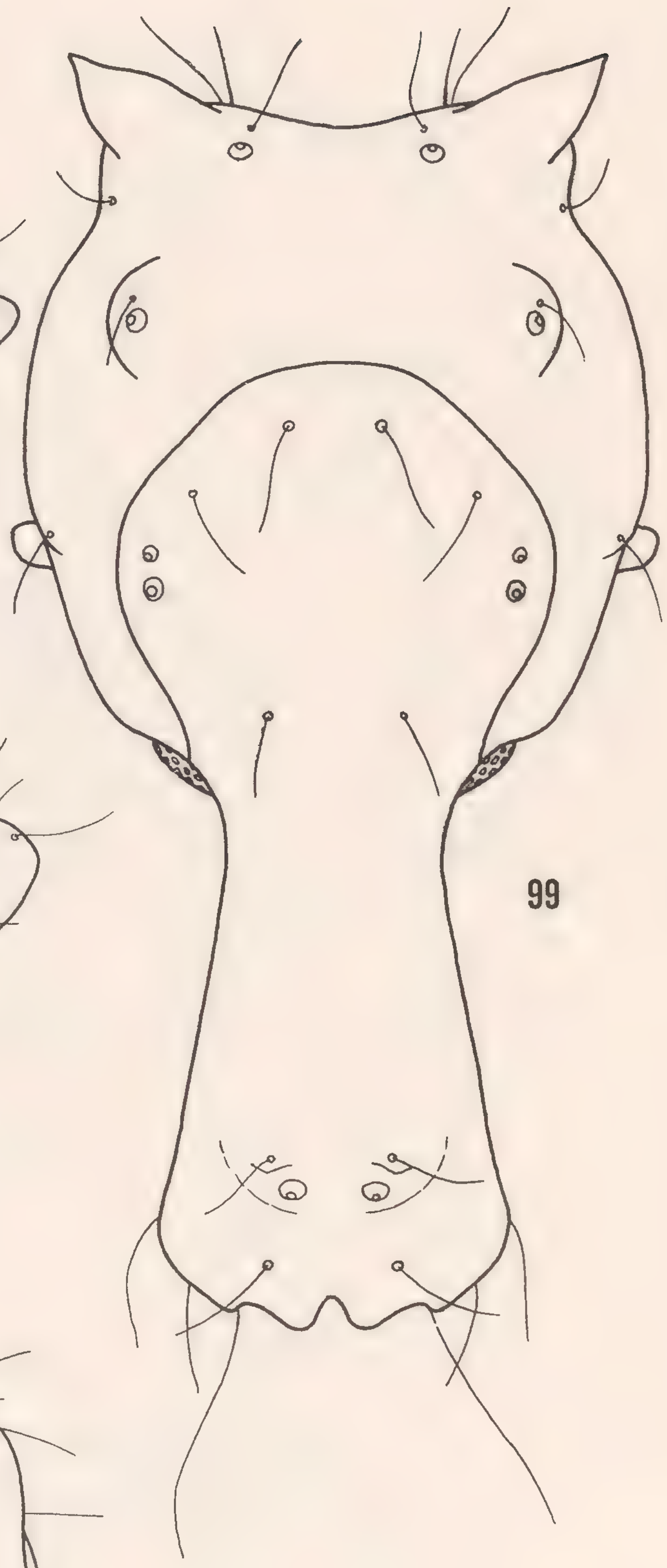

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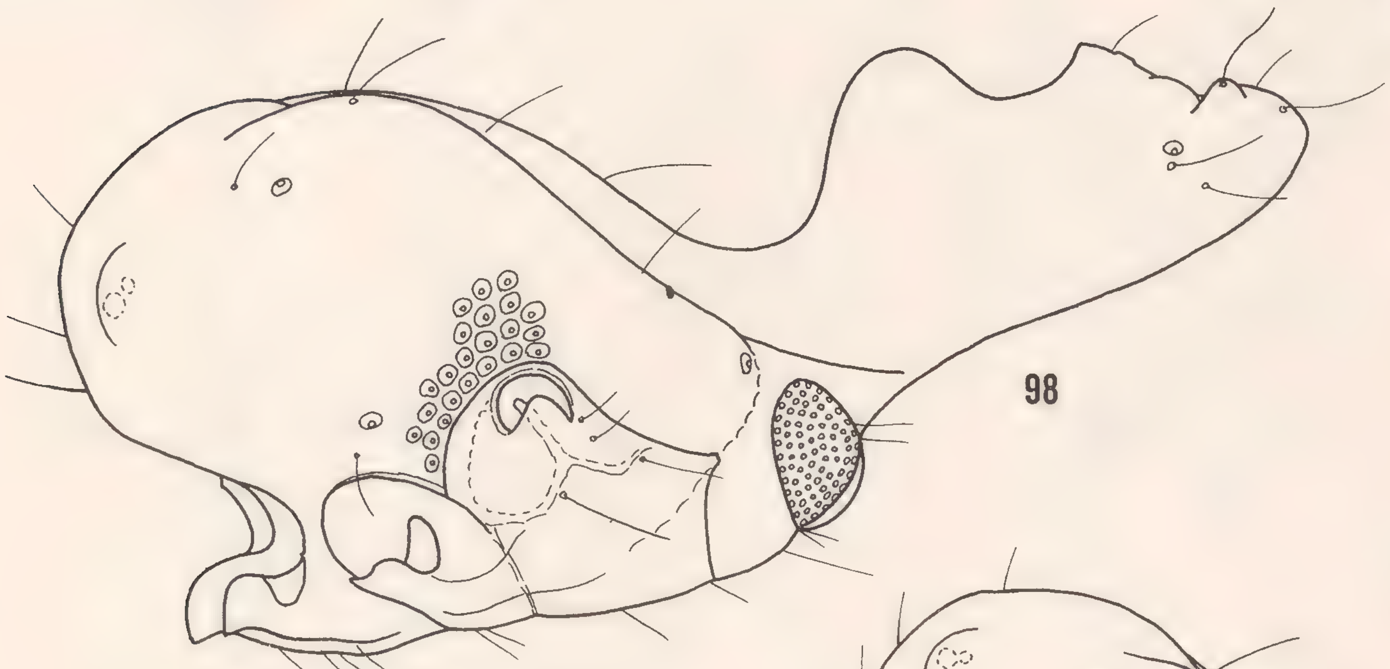

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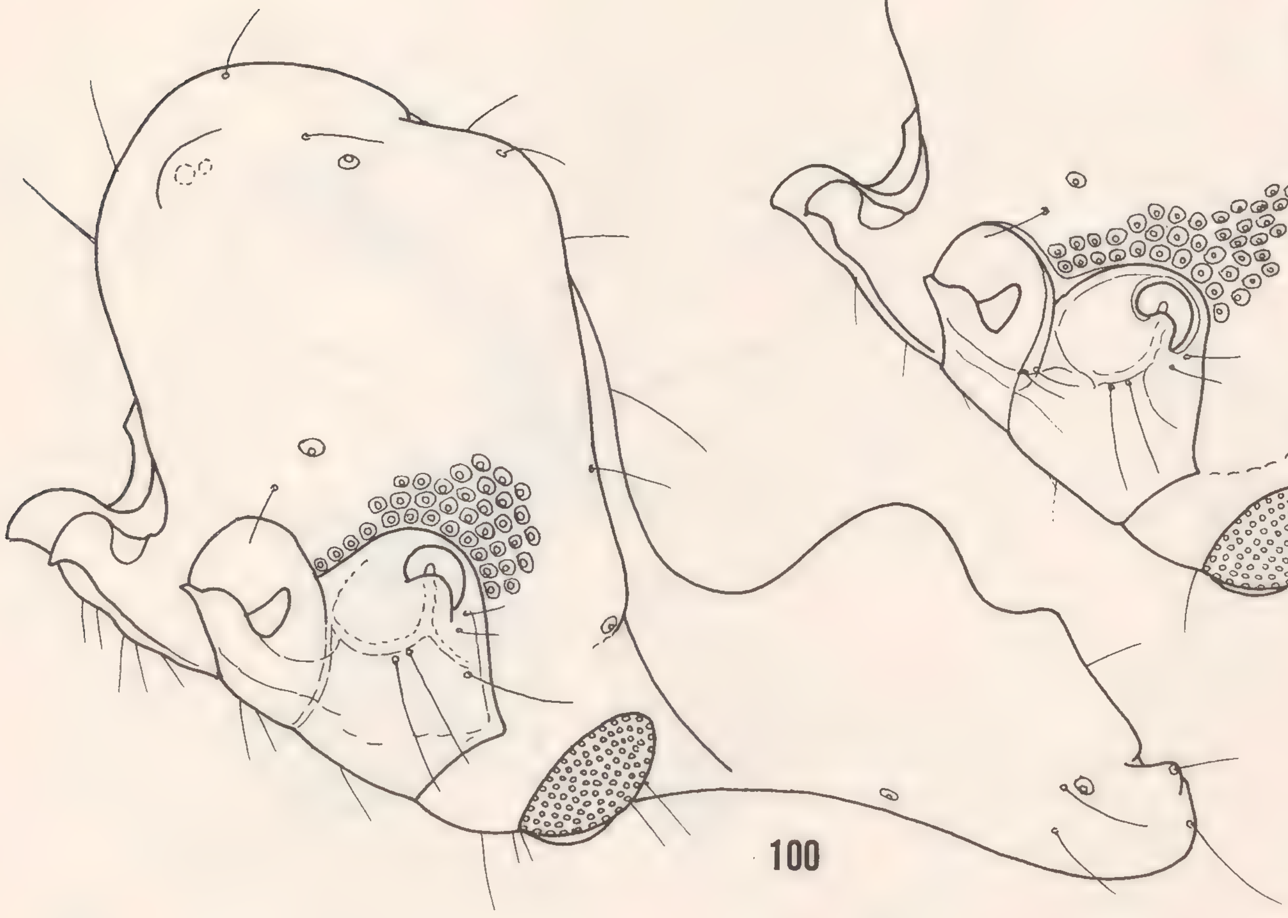

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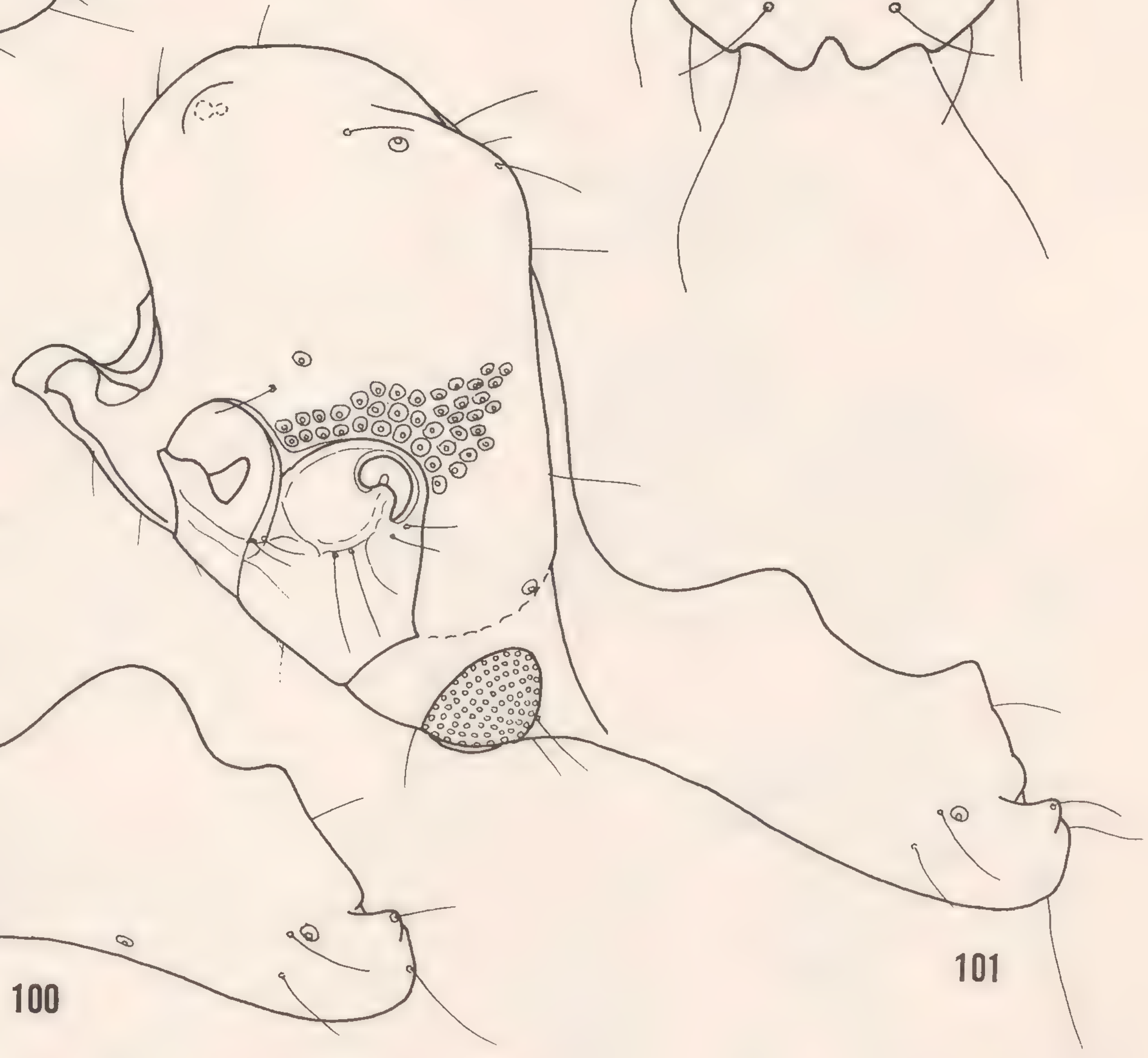
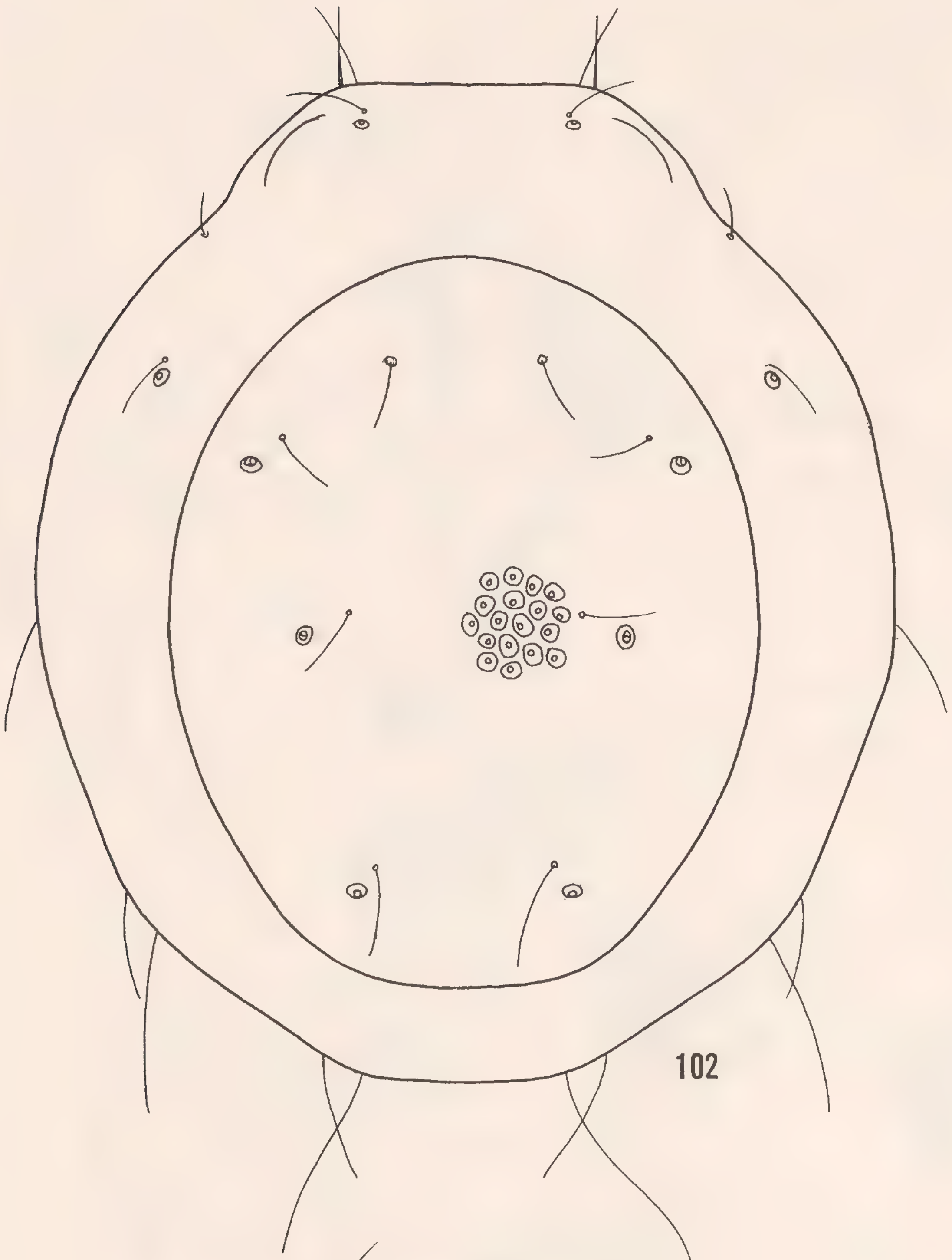


101

Arrenurus prodromocornis n. sp. Fig. 97, lateral view, ♂; Fig. 99, dorsal view, ♂.
Arrenurus rulumus n. sp. Fig. 98, lateral view, ♂.
Arrenurus pandarus n. sp. Fig. 100, lateral view, ♂.
Arrenurus pilumnus n. sp. Fig. 101, lateral view, ♂.



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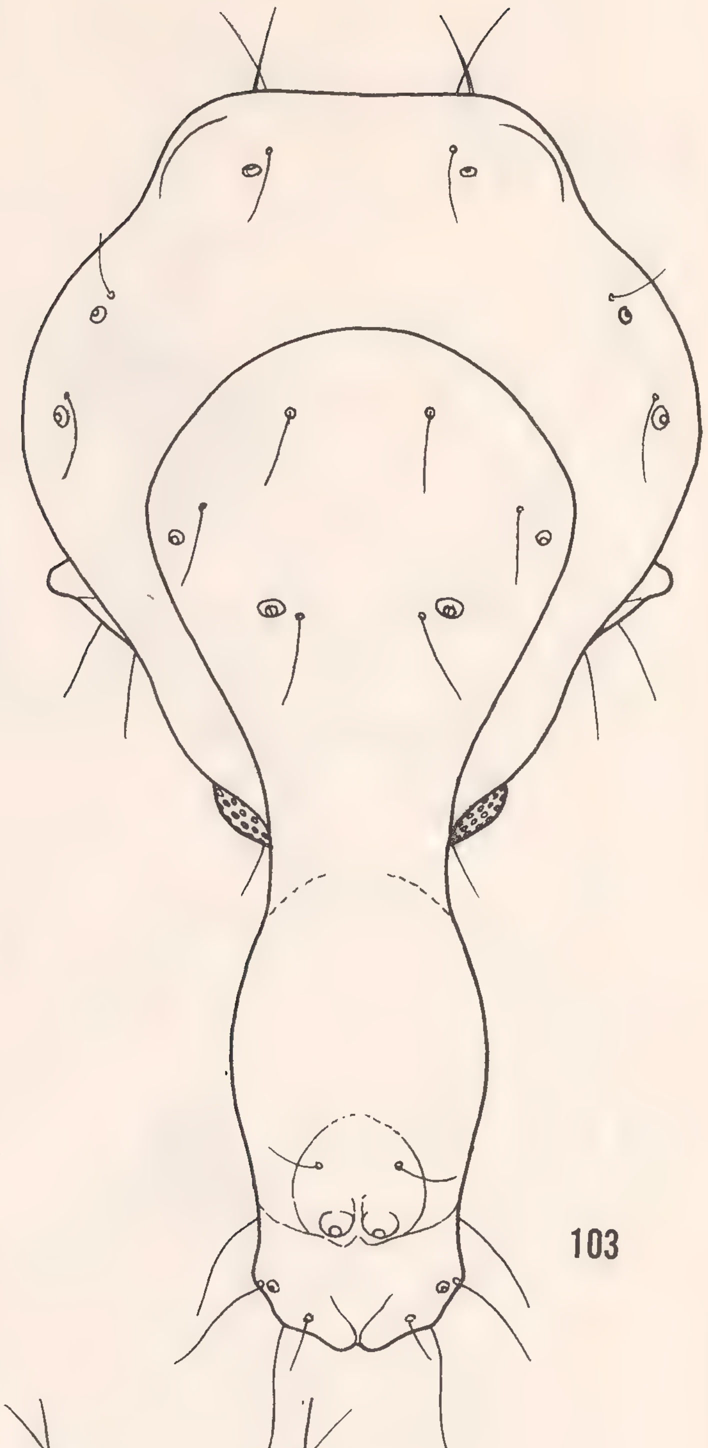

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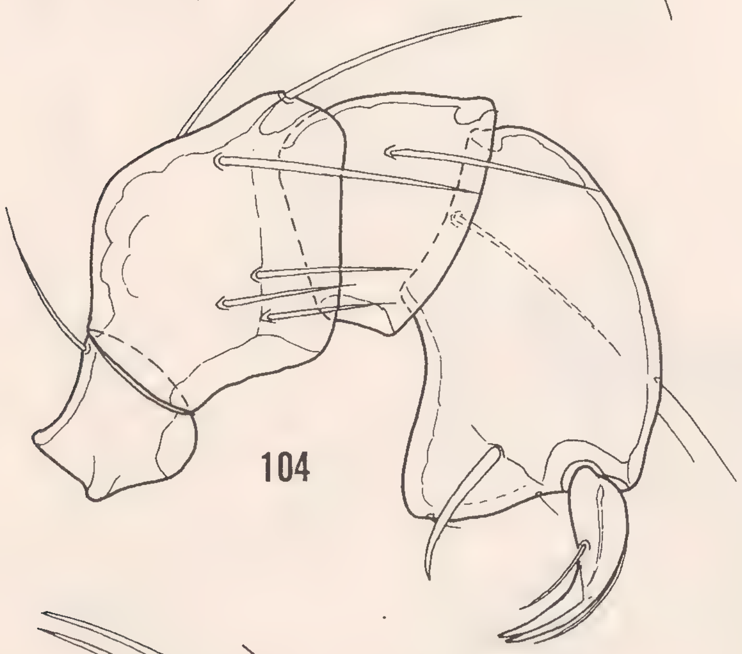

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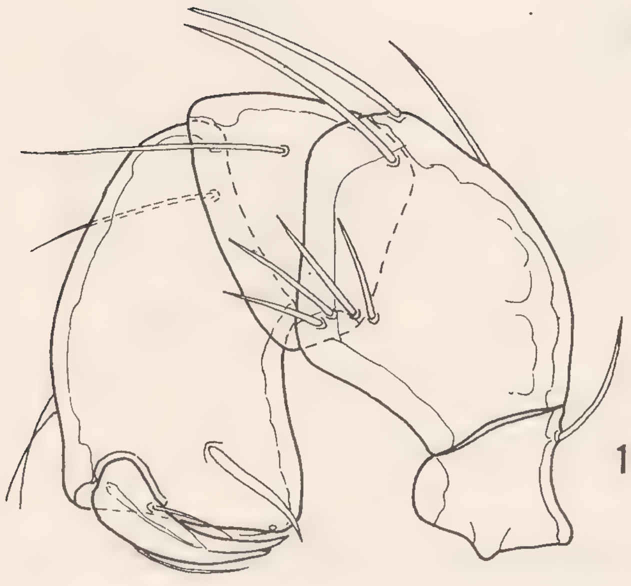

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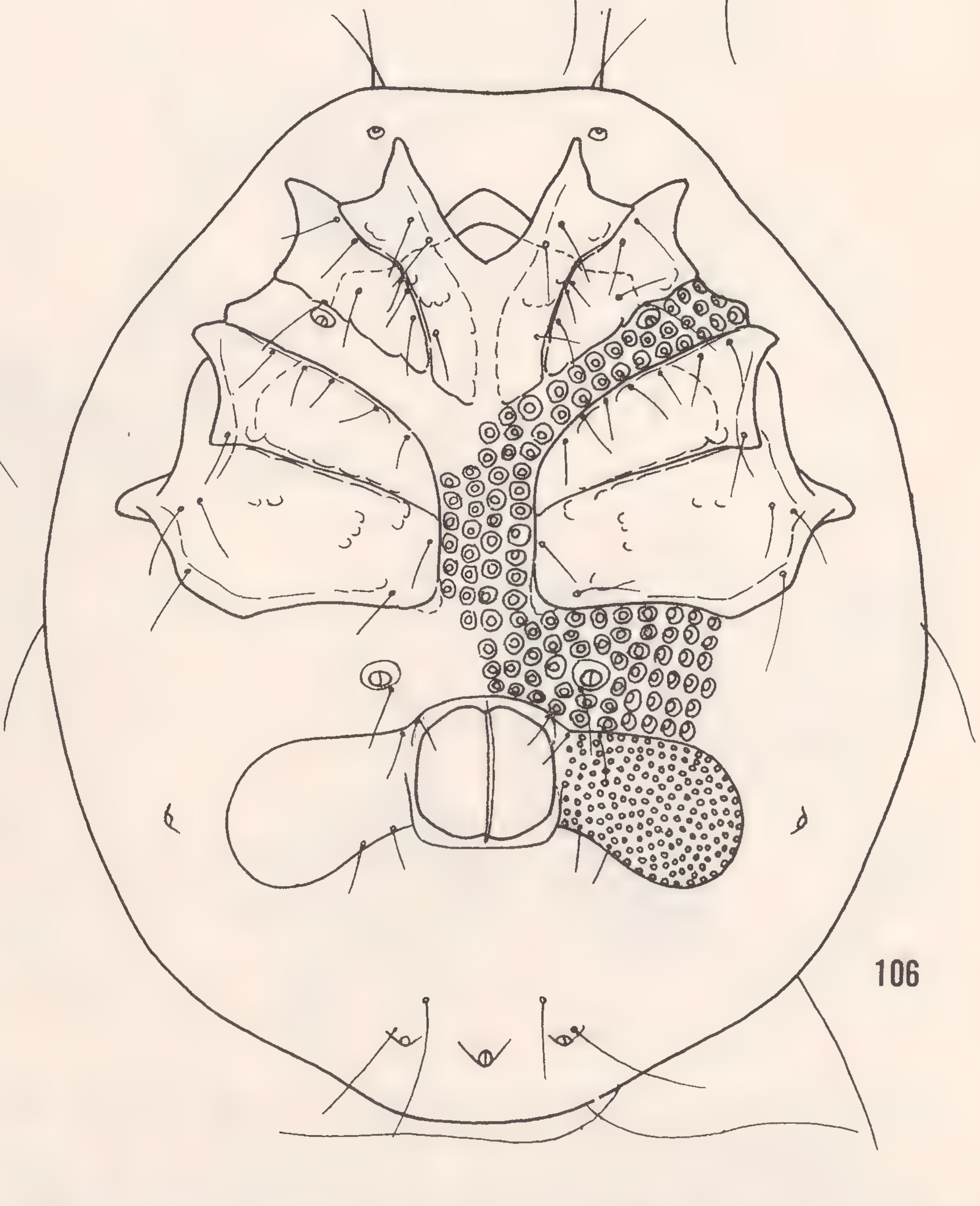
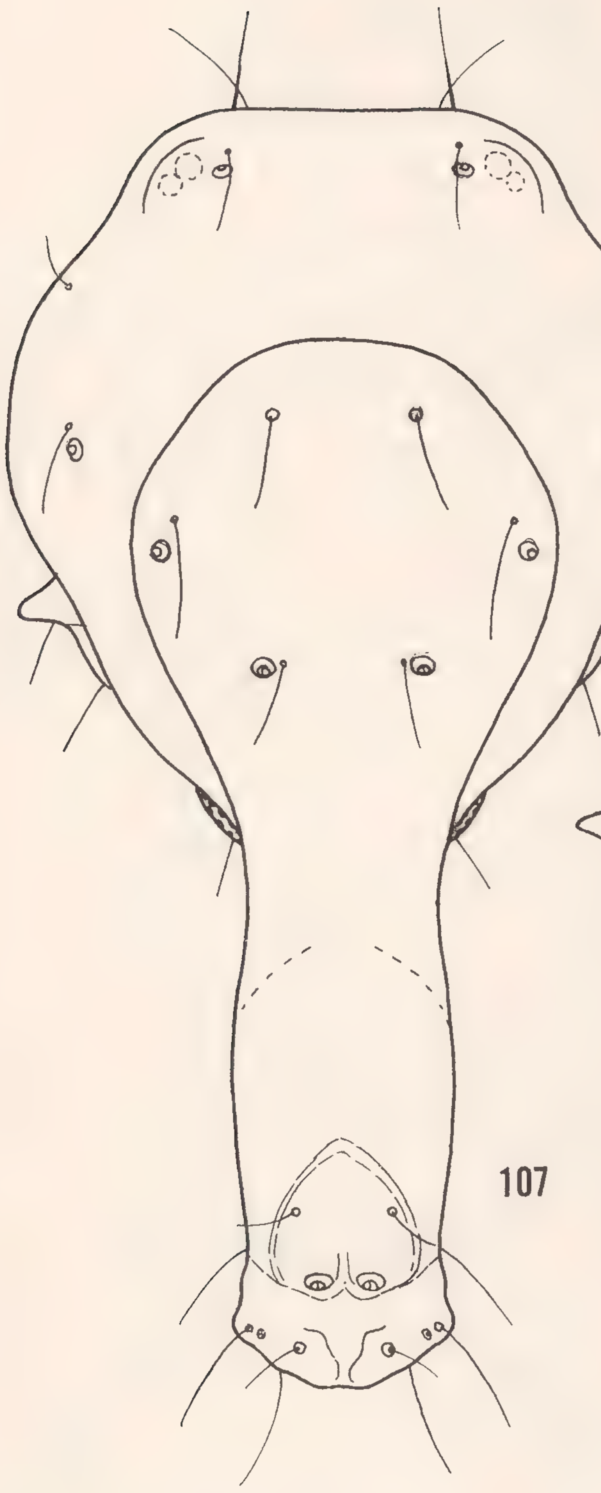


106

Arrenurus pandarus n. sp. Fig. 102, dorsal view, ♀; Fig. 103, dorsal view, ♂; Fig. 105, palp, ♀; Fig. 106, ventral view, ♀.
Arrenurus pilumnus n. sp. Fig. 104, palp, ♂.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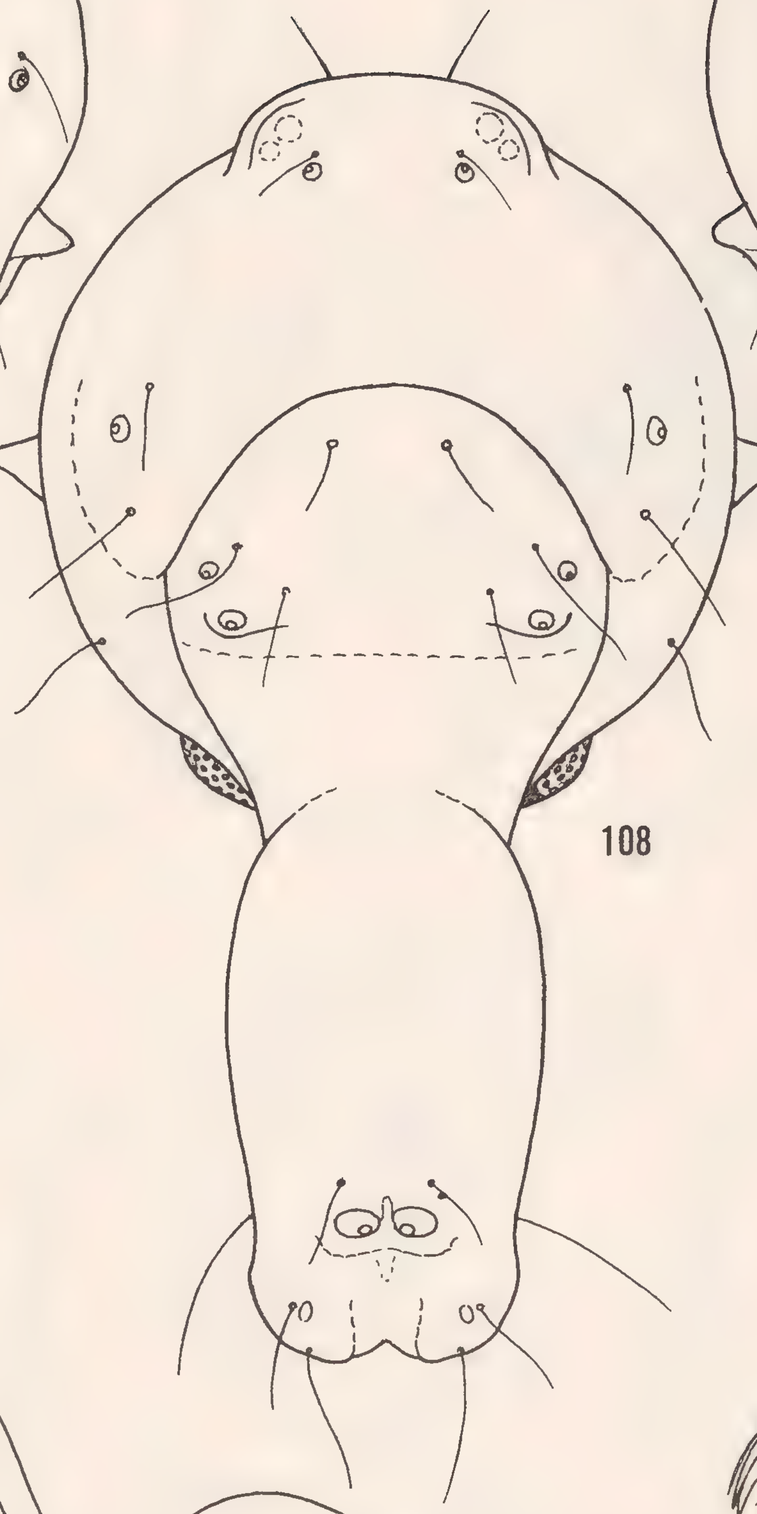
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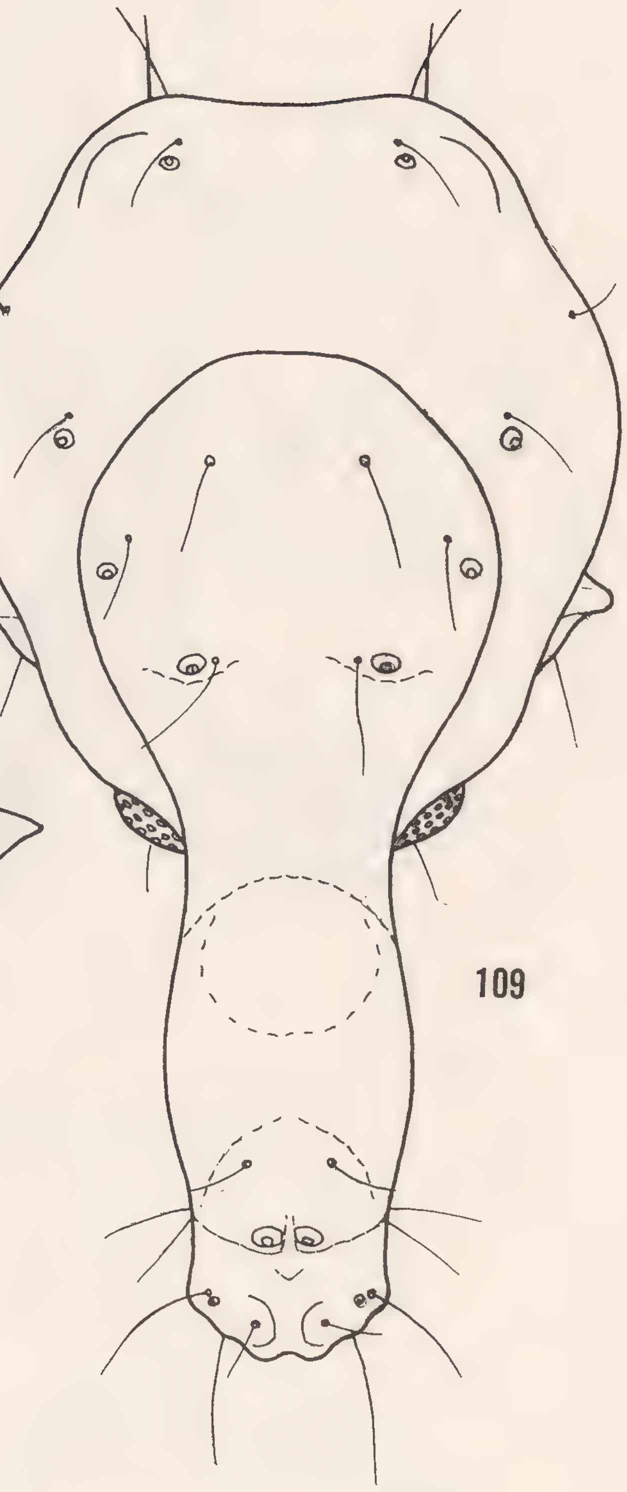
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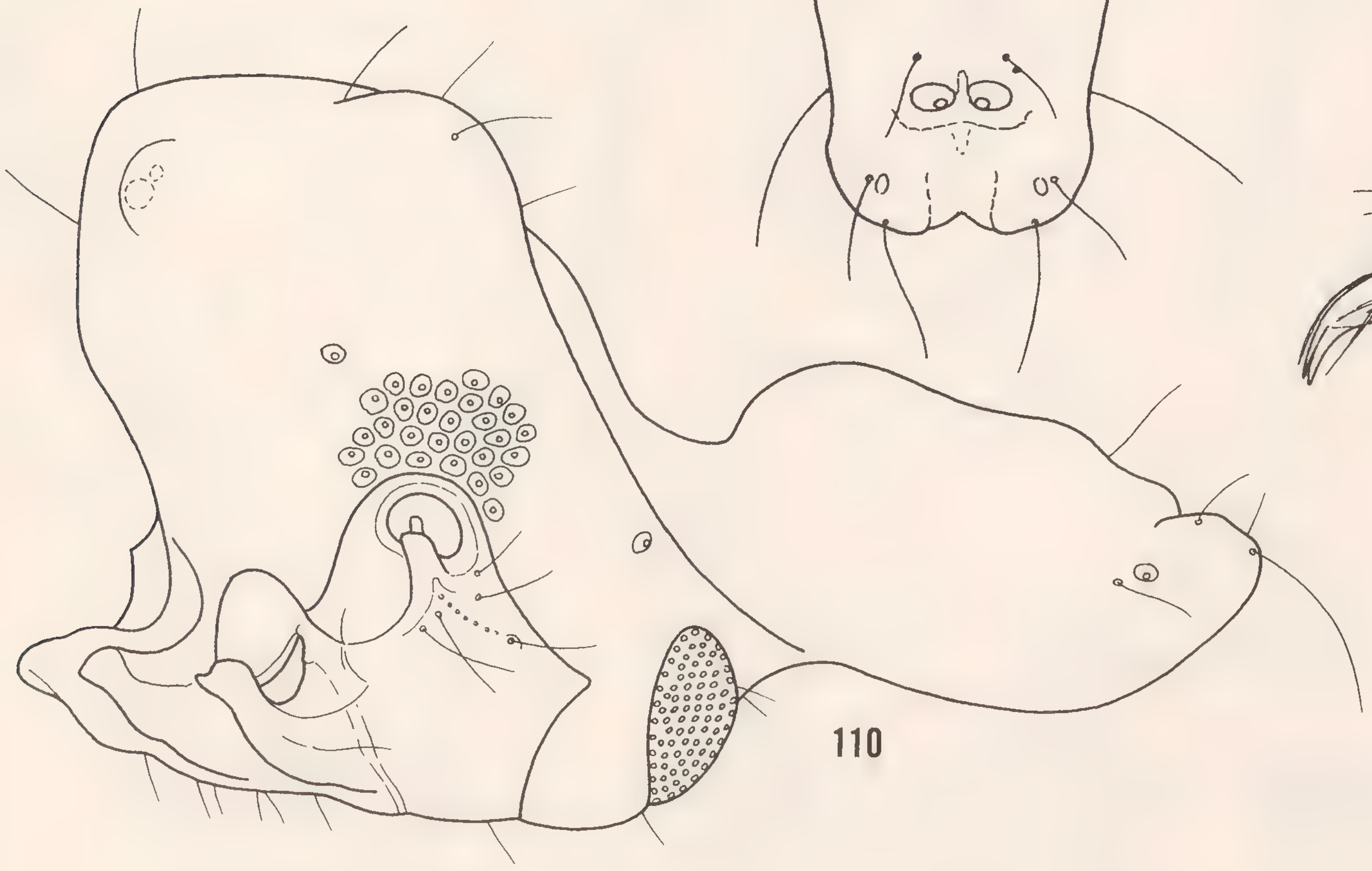
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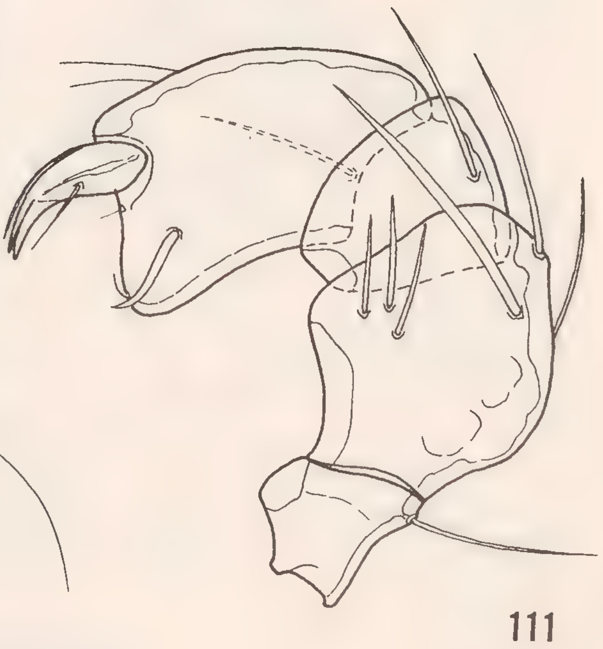
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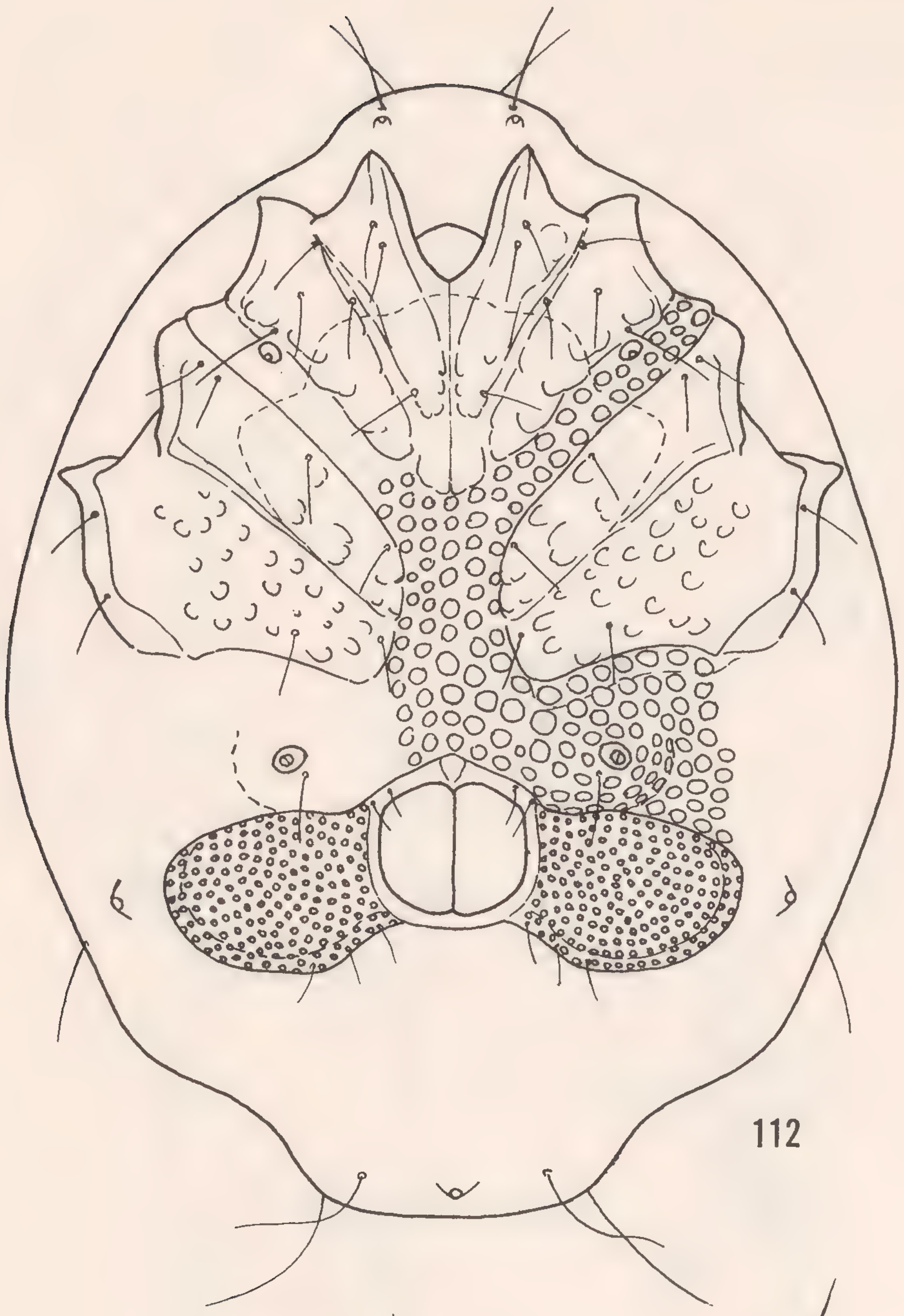
Arrenurus pilumnus n. sp. Fig. 107, dorsal view, ♂.
Arrenurus odatus n. sp. Fig. 108, dorsal view, ♂; Fig. 110, lateral view, ♂.
Arrenurus rulumus n. sp. Fig. 109, dorsal view, ♂; Fig. 111, palp, ♂.



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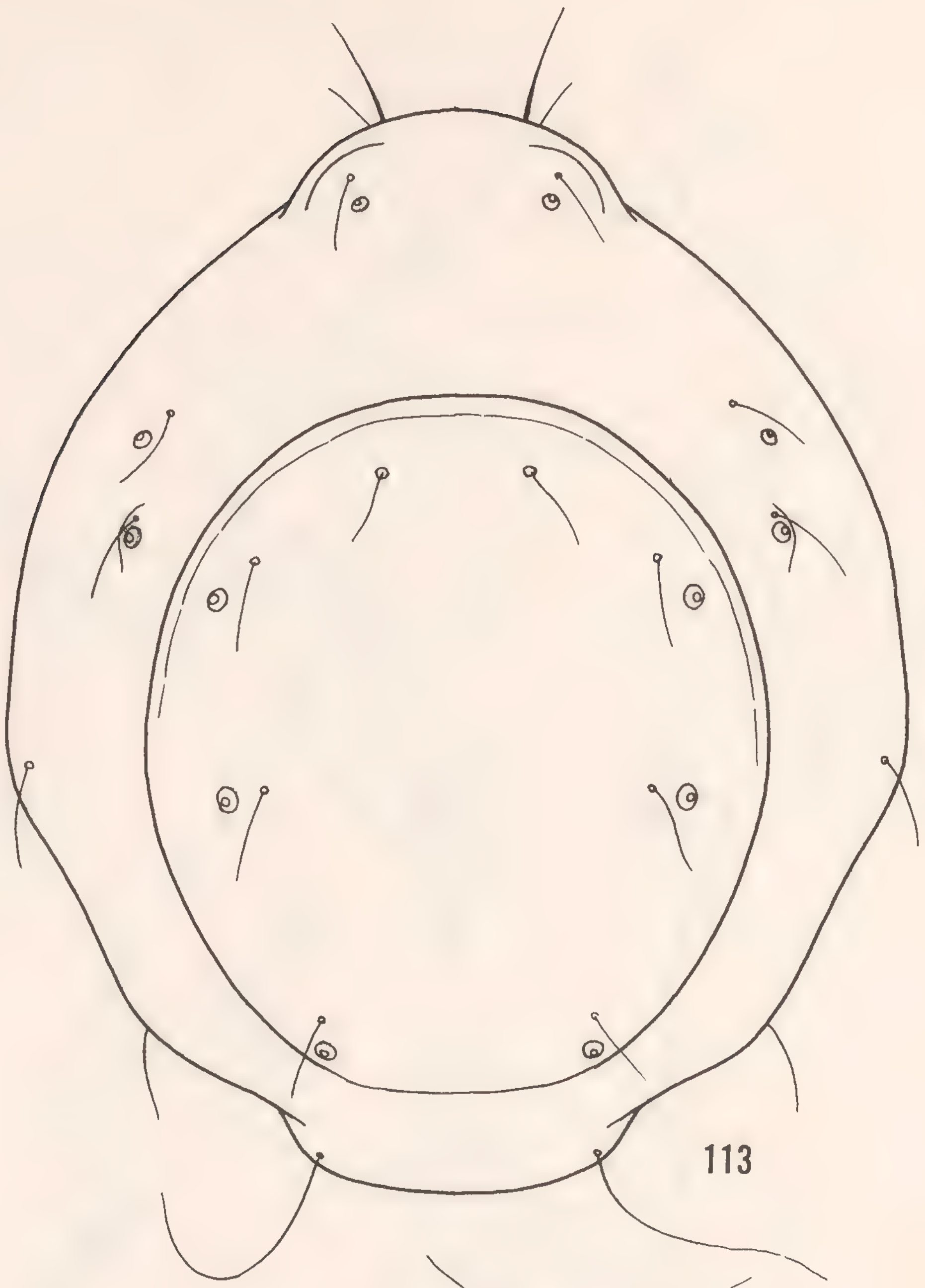
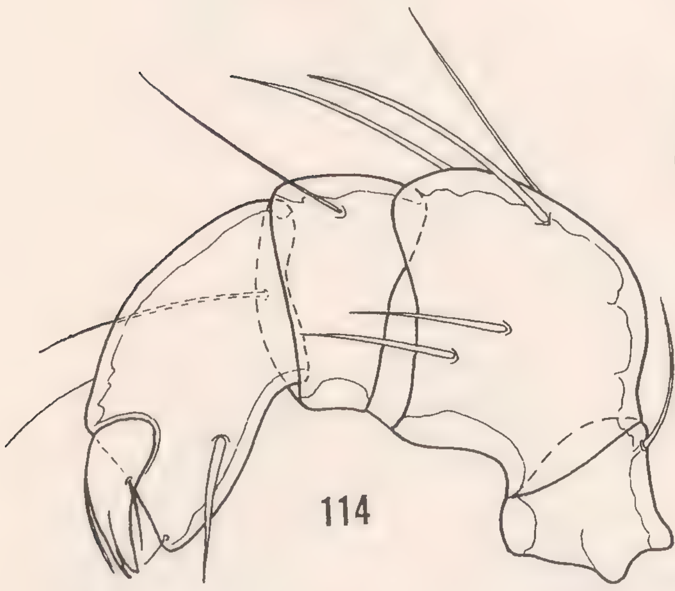


113



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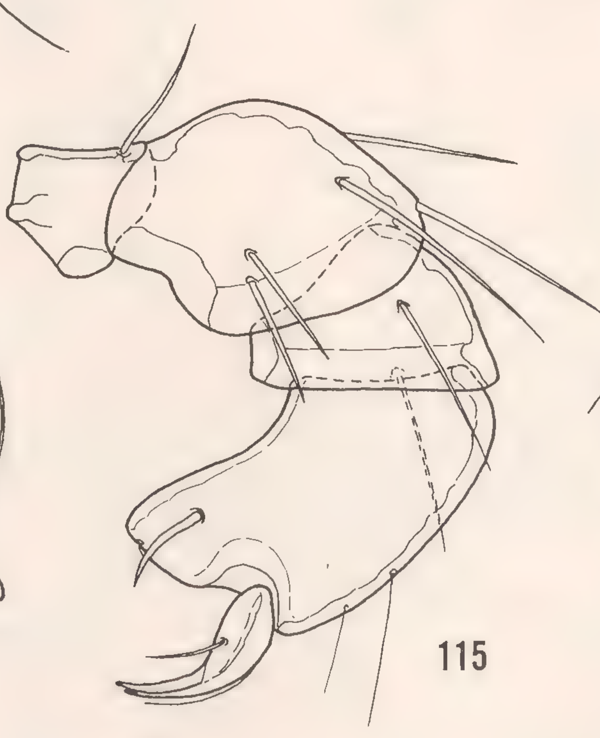

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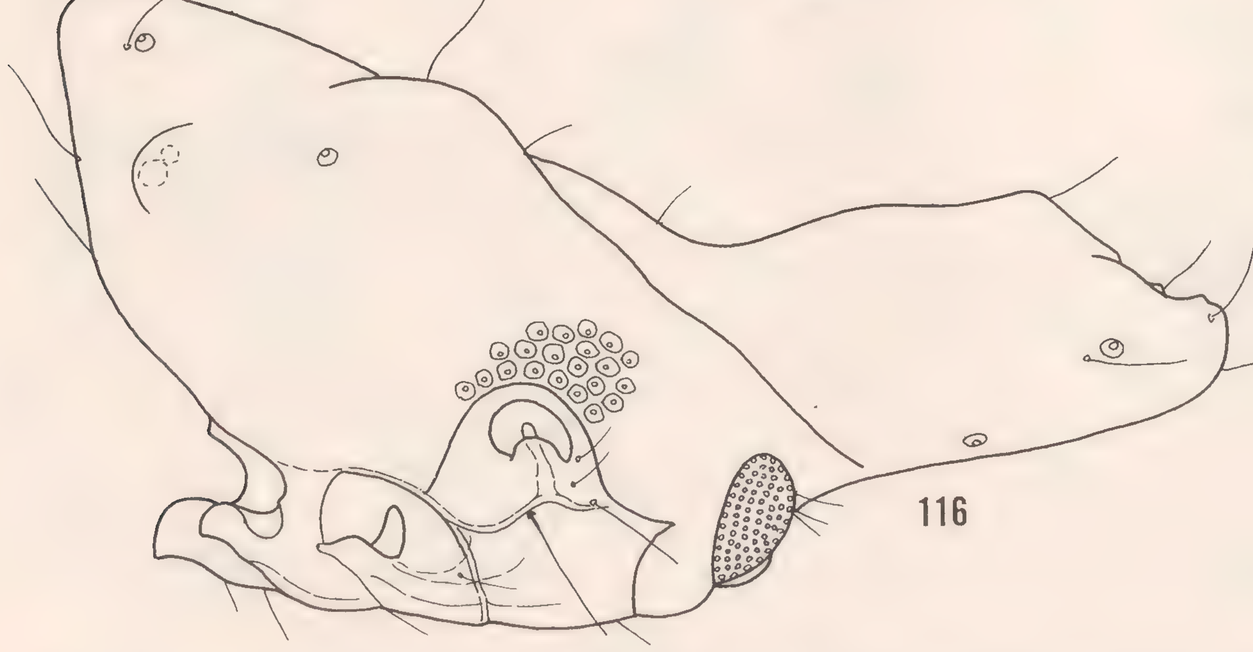

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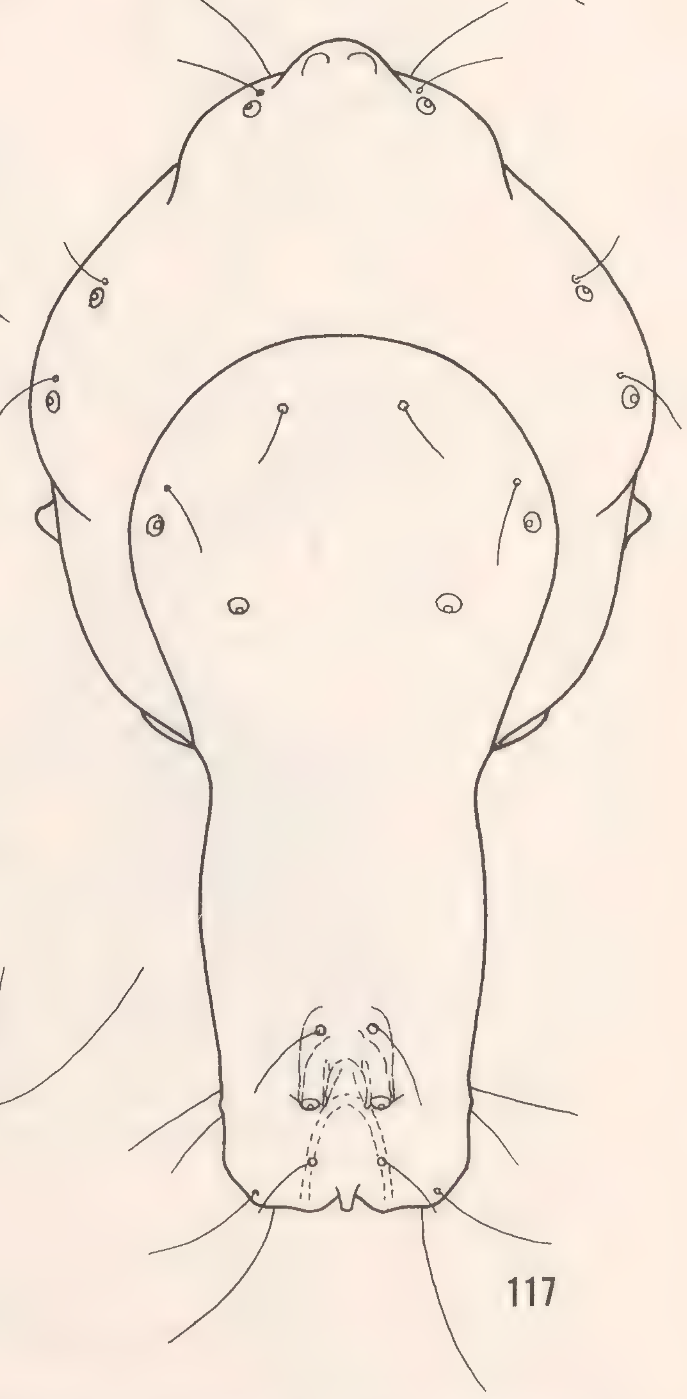
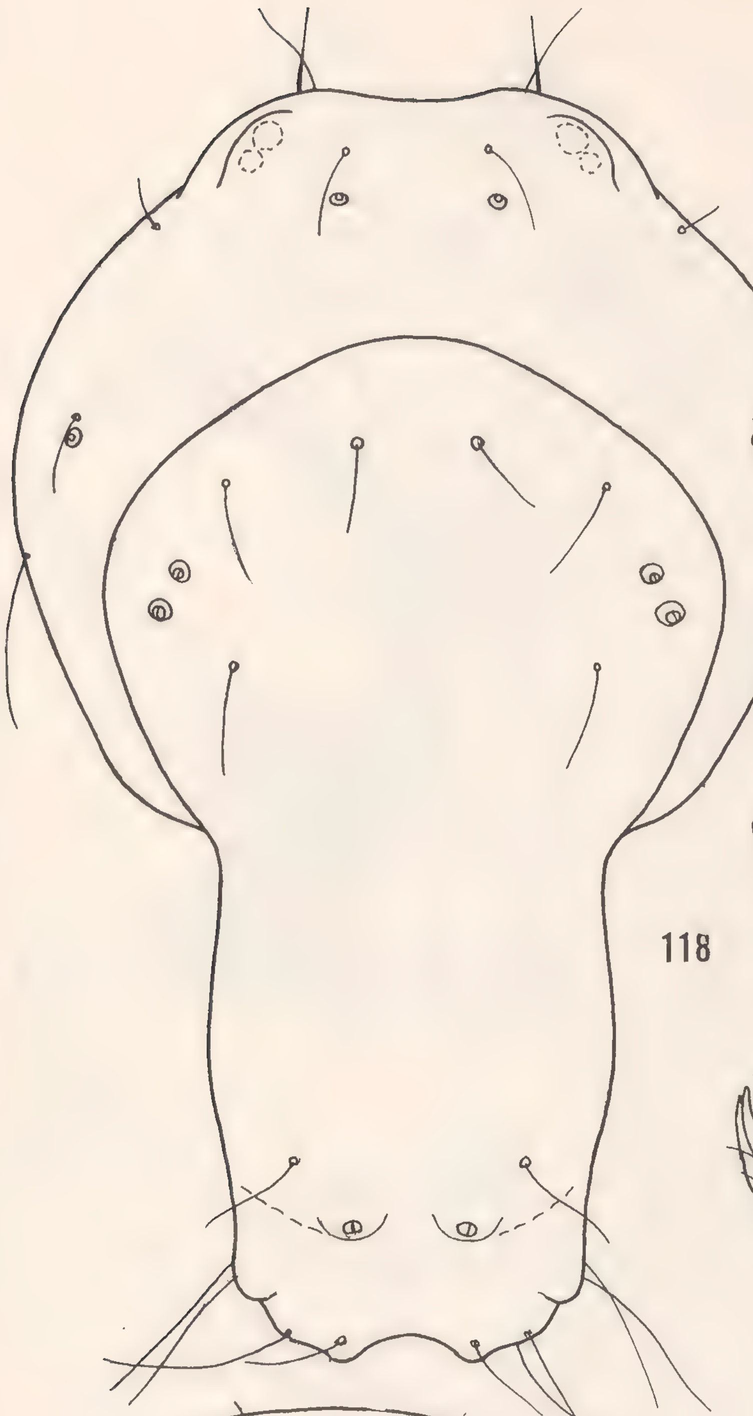


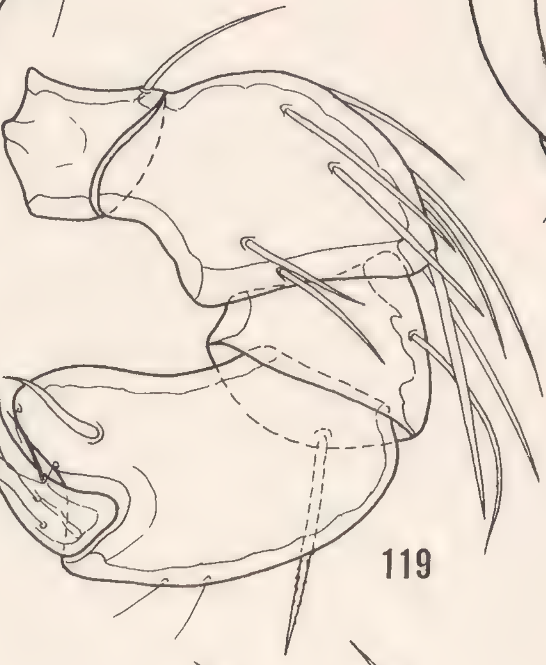
117

Arrenurus odatus n. sp. Fig. 112, ventral view, ♀; Fig. 113, dorsal view, ♀; Fig. 114, palp, ♂.

Arrenurus nasus n. sp. Fig. 115, palp, ♂; Fig. 116, lateral view, ♂; Fig. 117, dorsal view, ♂.



118



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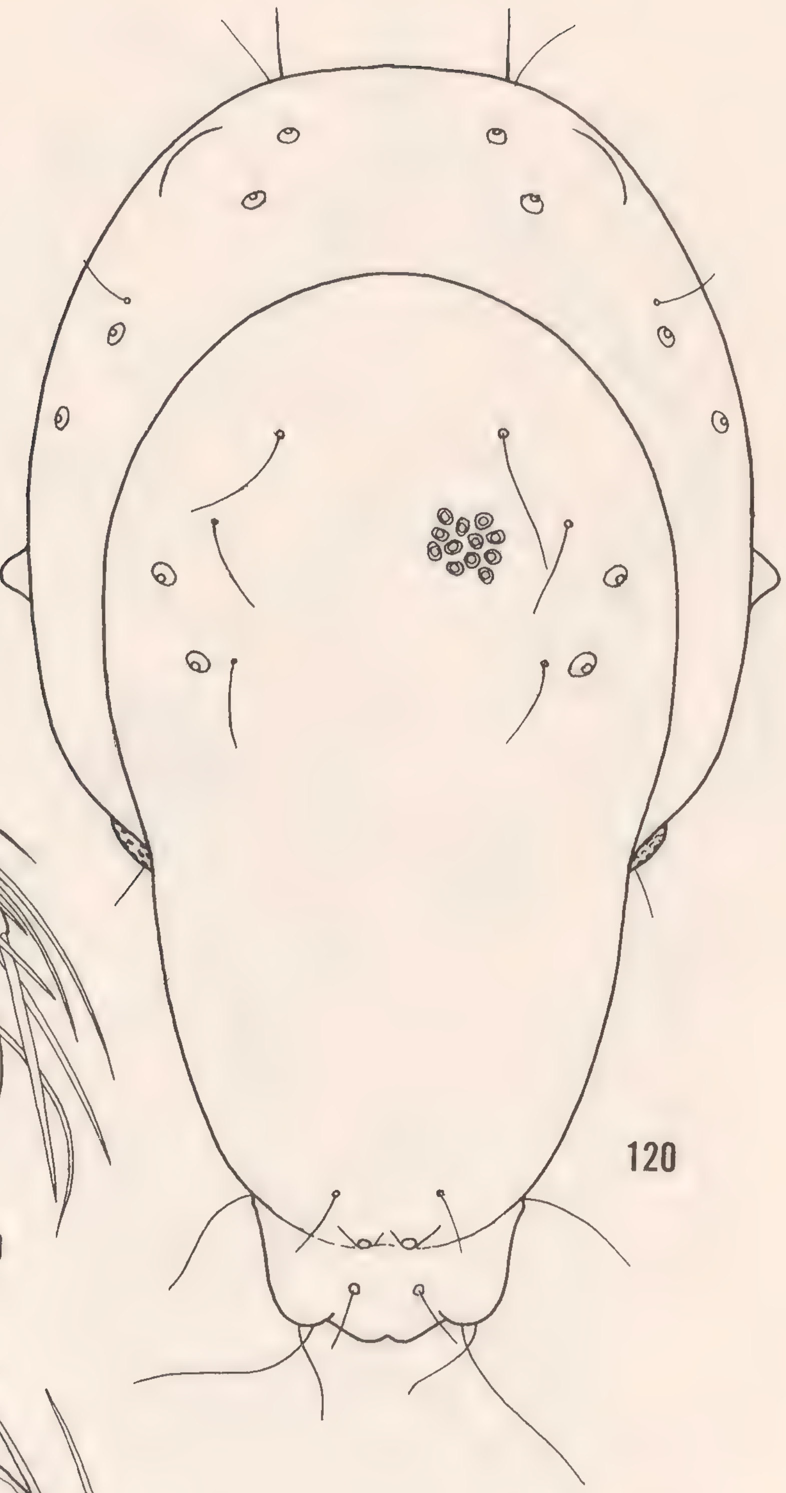

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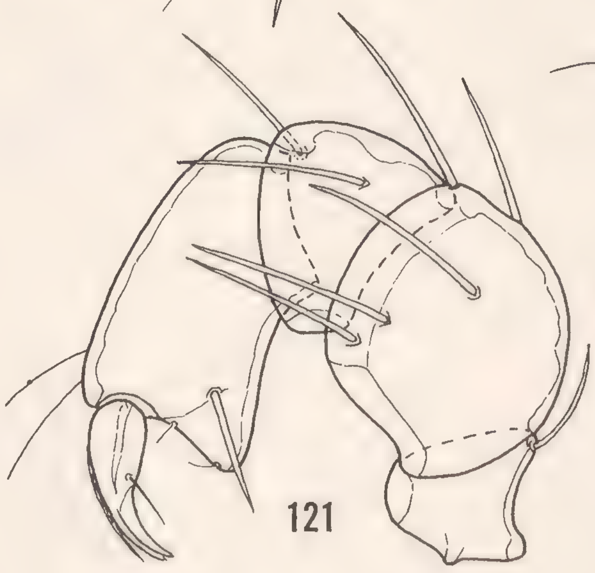

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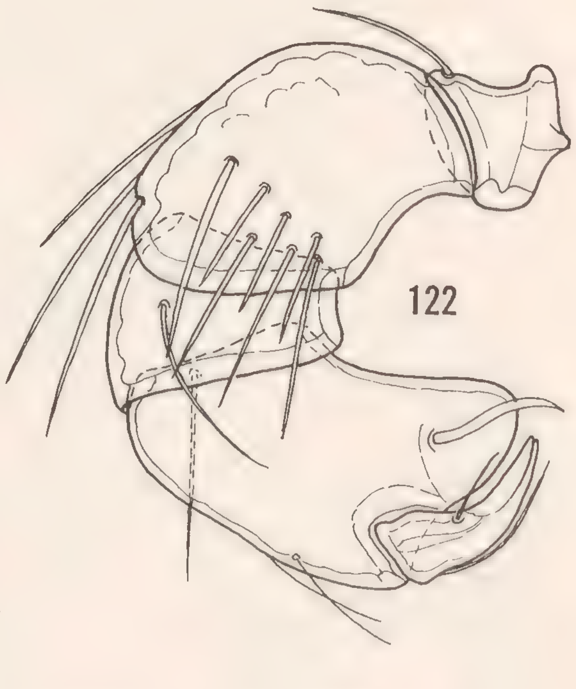

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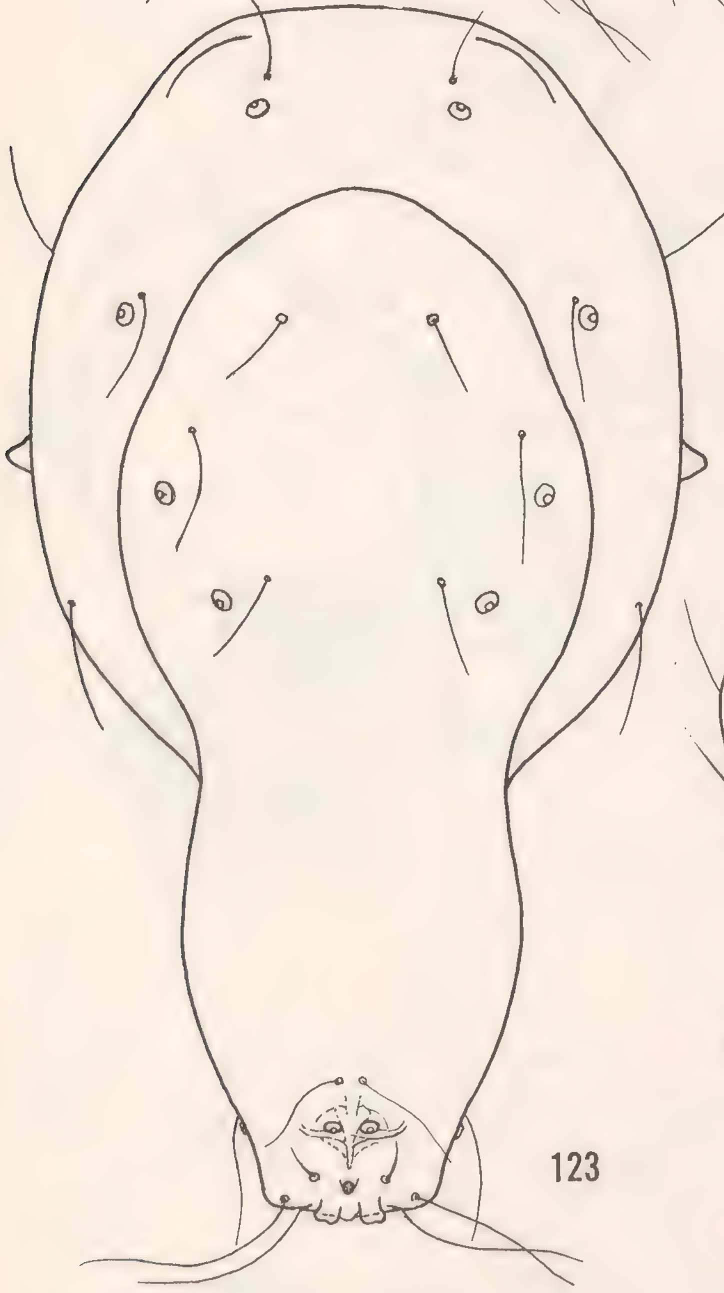
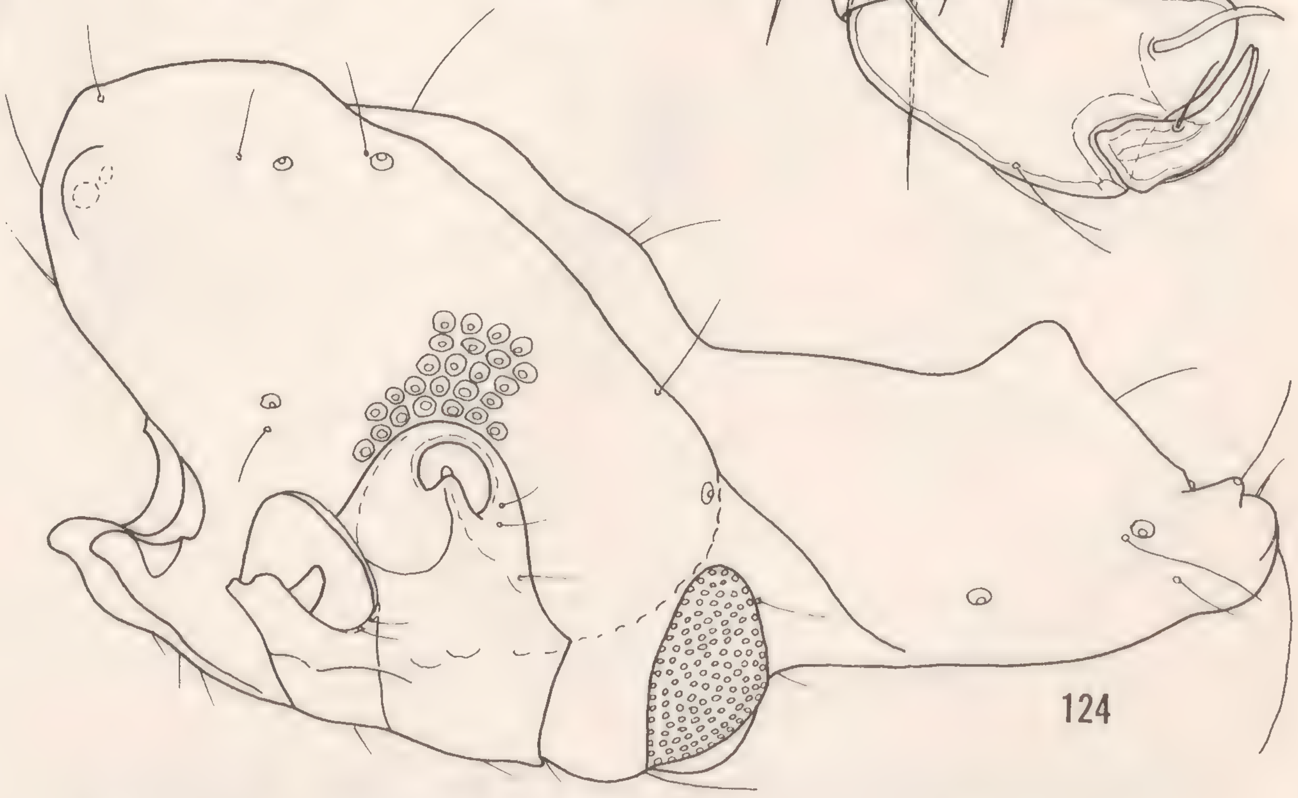
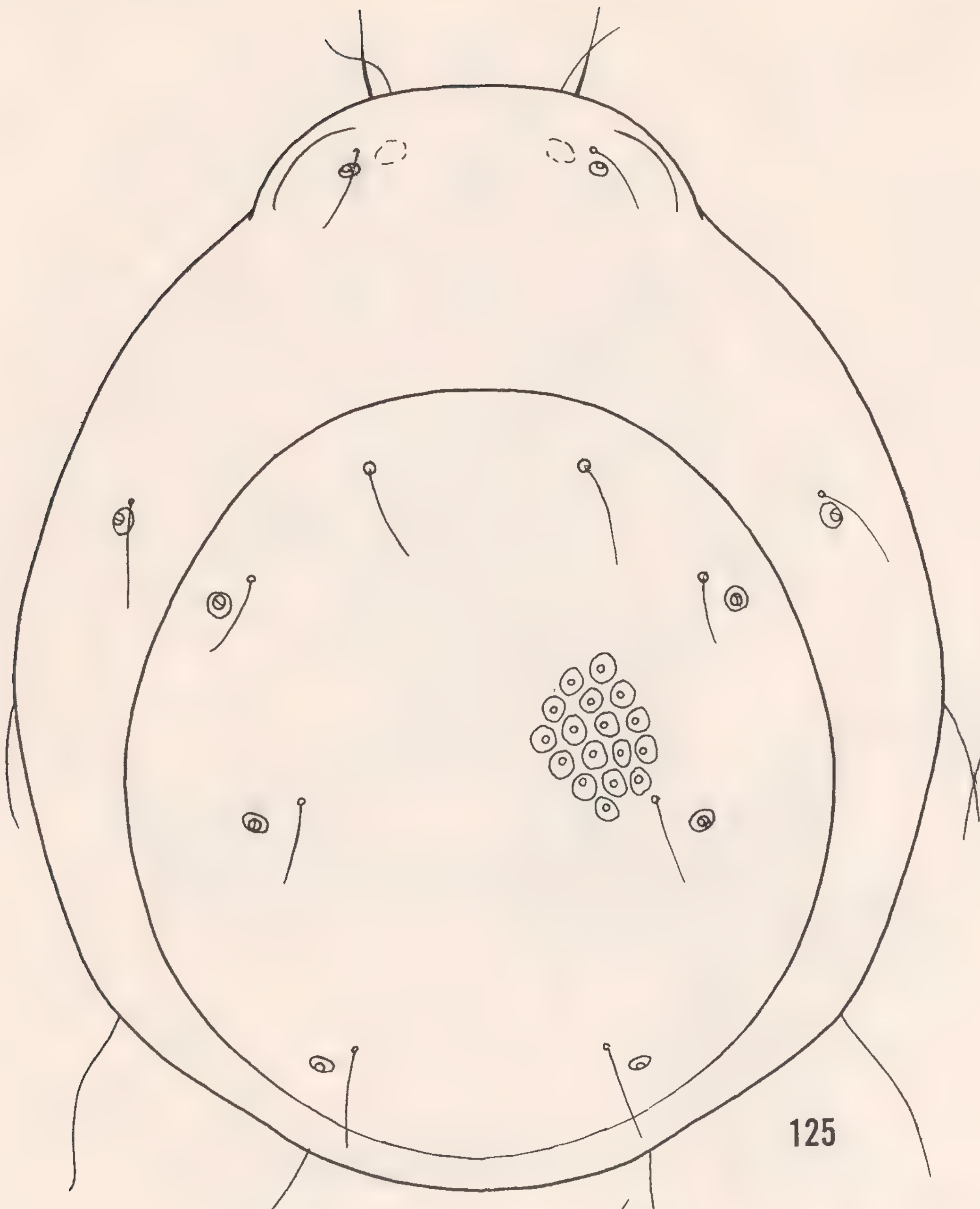


123

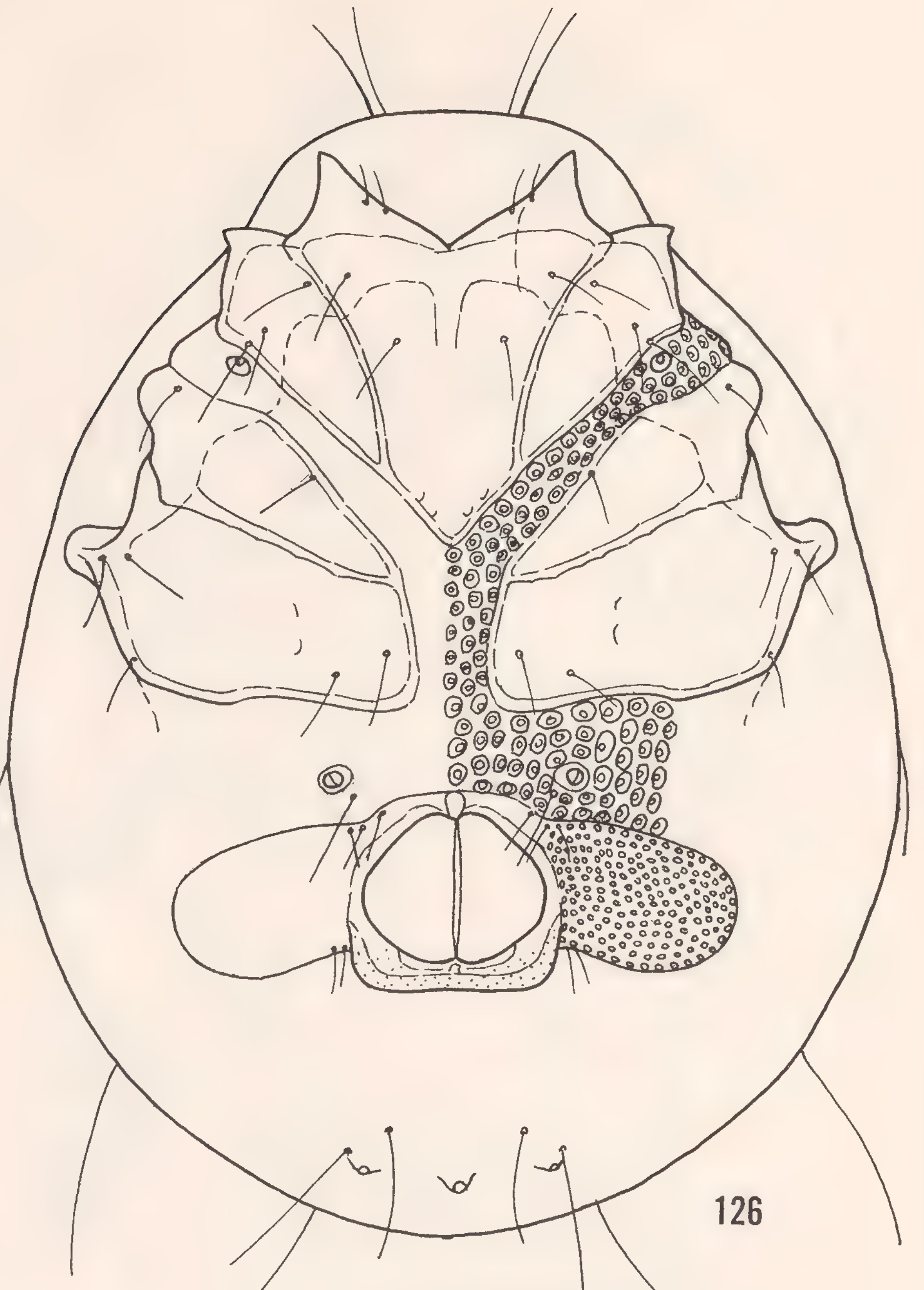


124

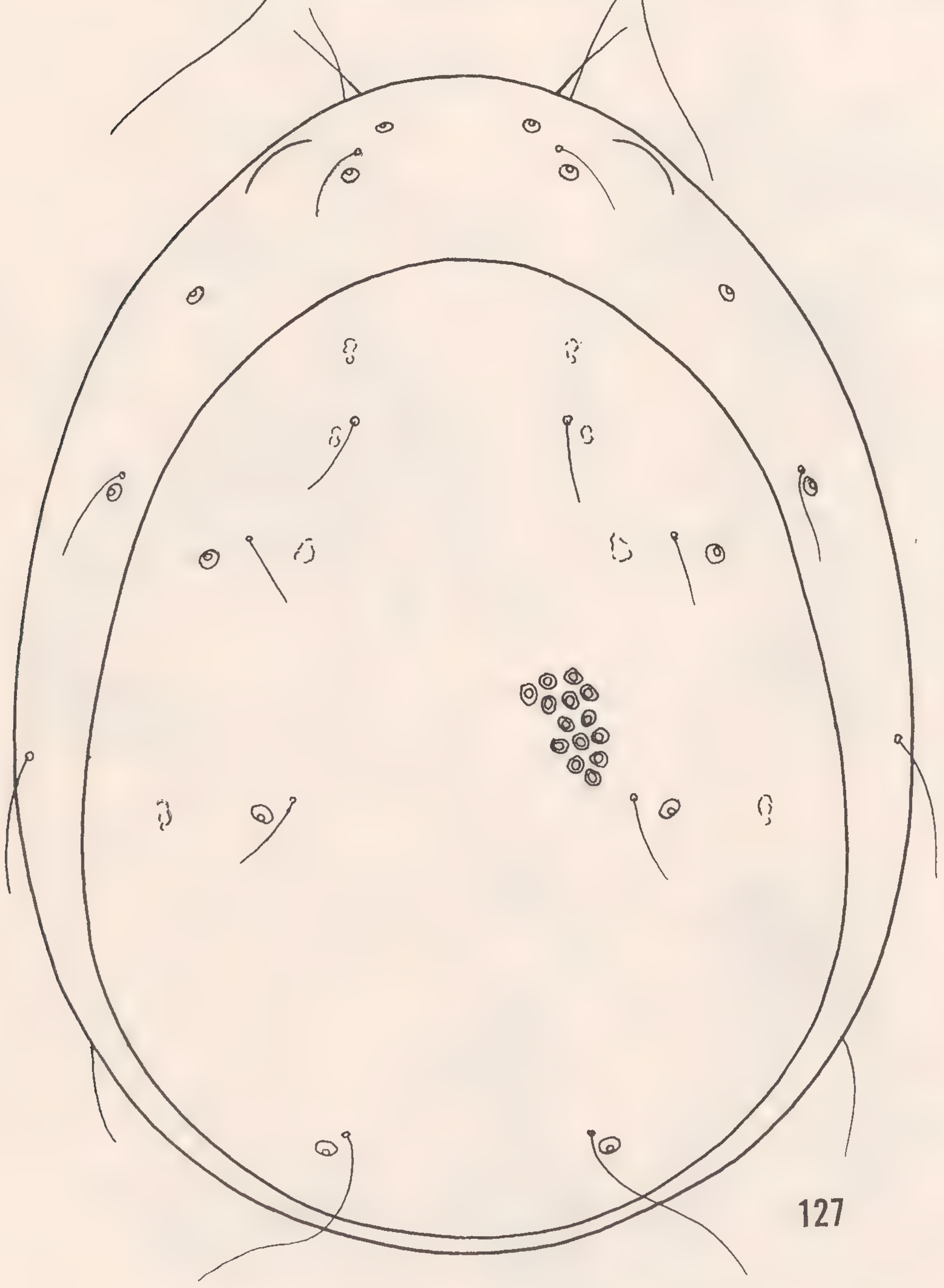
Arrenurus nedymus n. sp. Fig. 118, dorsal view, ♂; Fig. 121, palp, ♂.
Arrenurus optatus n. sp. Fig. 119, palp, ♂; Fig. 120, dorsal view, ♂.
Arrenurus opiparus n. sp. Fig. 122, palp, ♂; Fig. 123, dorsal view ♂.
Arrenurus melemus n. sp. Fig. 124, lateral view, ♂.



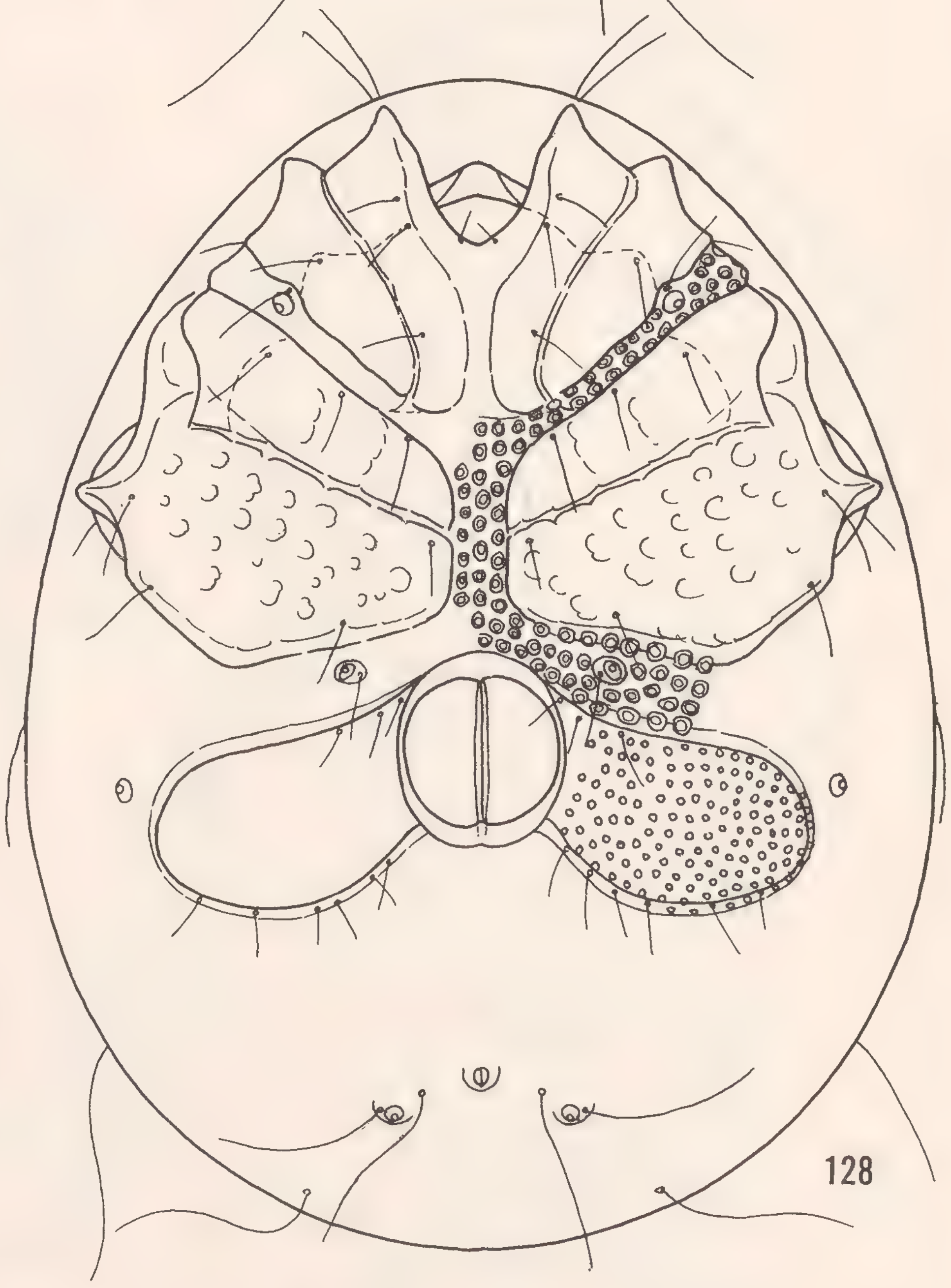
125



126

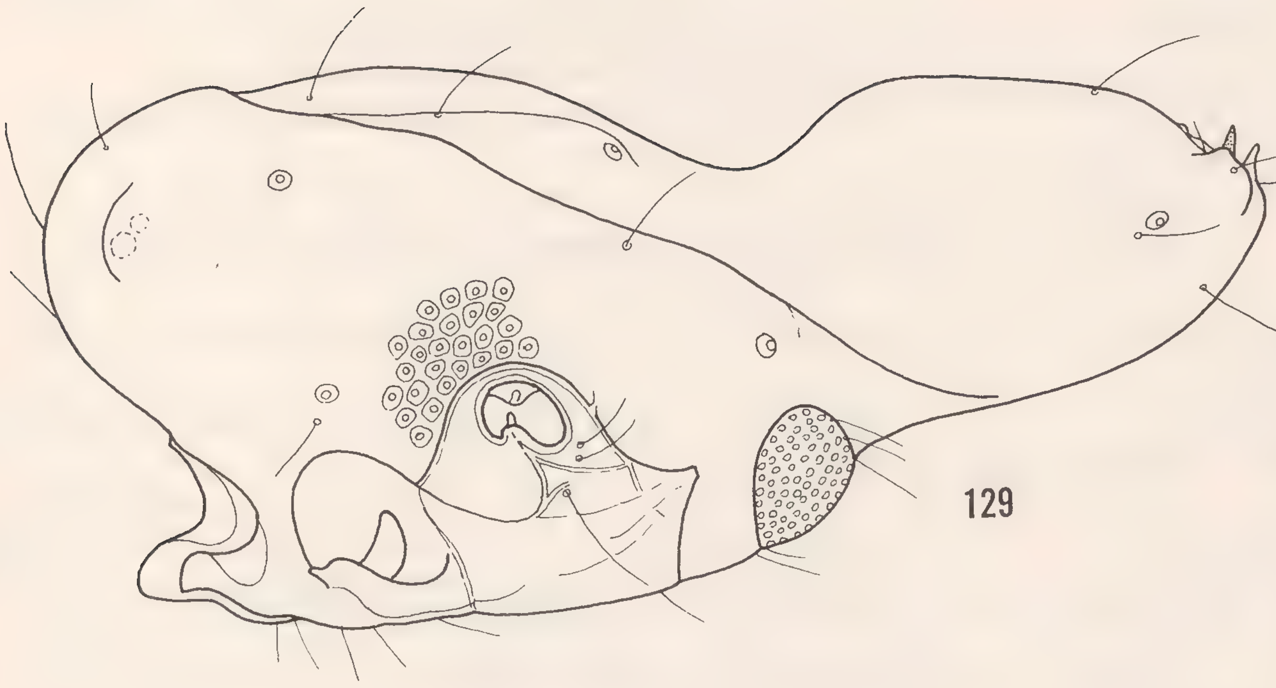


127



128

Arrenurus melemus n. sp. Fig. 125, dorsal view, ♀; Fig. 126, ventral view, ♀.
Arrenurus optatus n. sp. Fig. 127, dorsal view, ♀; Fig. 128, ventral view, ♀.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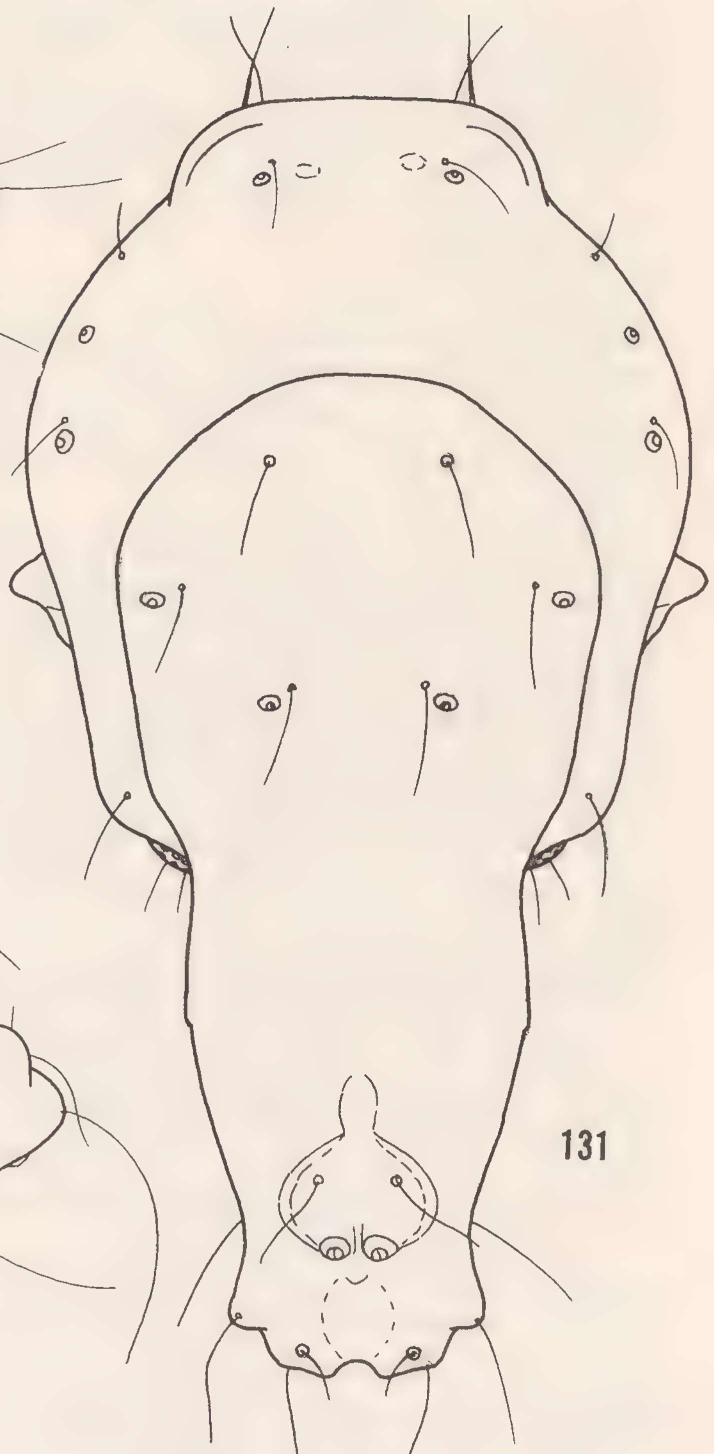
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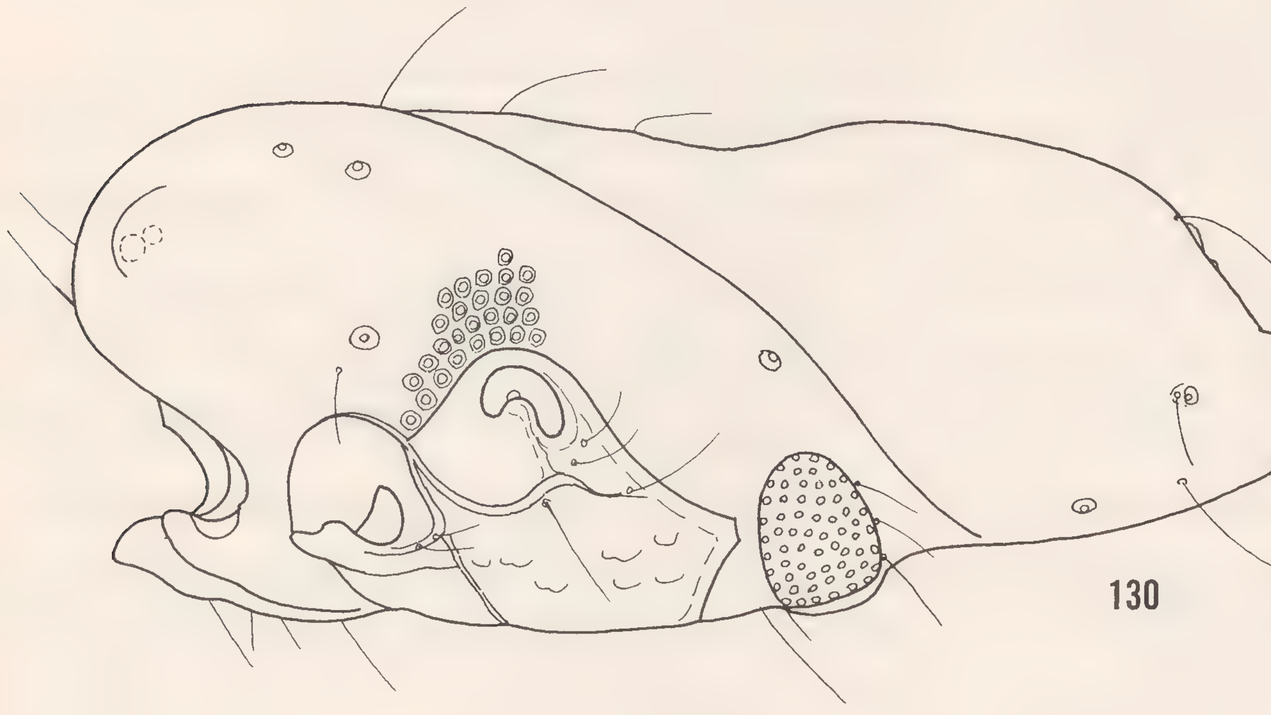
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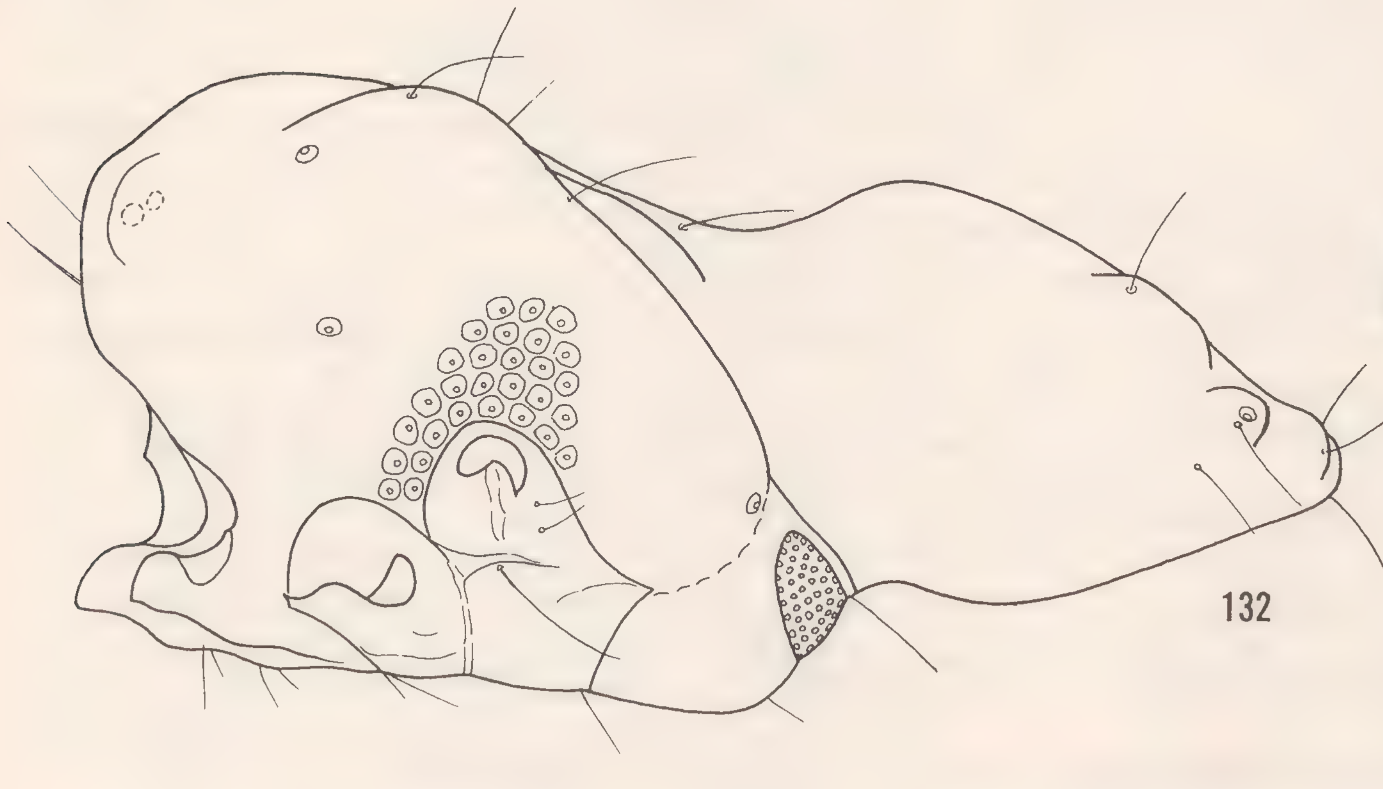
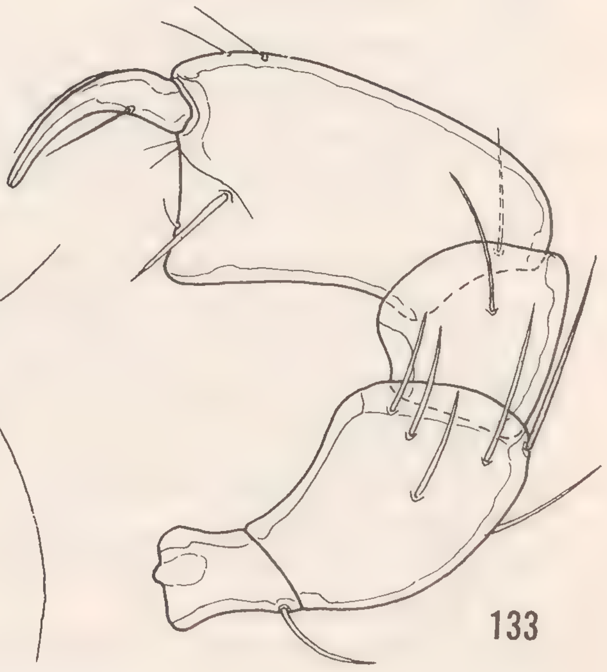

132


133

Arrenurus opiparus n. sp. Fig. 129, lateral view, ♂.
Arrenurus optatus n. sp. Fig. 130, lateral view, ♂.
Arrenurus melemus n. sp. Fig. 131, dorsal view, ♂; Fig. 133, palp, ♀.
Arrenurus nedymus n. sp. Fig. 132, lateral view, ♂.

The main reference is underscored.

acutus (Arrenurus, Micruracarus) 18, 29
aguticornis (Arrenurus) 2, figs. 1, 3, 4
americanus-group 3, 4
apetiolatus (Arrenurus, Megaluracarus) 29
apopkensis (Arrenurus) 4, figs. 13, 14, 16
arizonensis (Arrenurus) 8, figs. 25, 26, 29
Arrenuridae 1
Arrenurus 1, 11
bartonensis (Arrenurus, Megaluracarus) 20
beltistus (Arrenurus) 10, figs. 49-51
bicaudatus (Arrenurus, Micruracarus) 18
birgei (Arrenurus, Megaluracarus) 19, 29
birgei-group 19
capillatus (Arrenurus, Megaluracarus) 27
cardiacus (Arrenurus, Megaluracarus) 29
crenellatus (Arrenurus, Micruracarus) 17
dentipetiolatus (Arrenurus) 10
elevatus (Arrenurus, Megaluracarus) 23, 24
expansus (Arrenurus, Megaluracarus) 29
facetopsis (Arrenurus) 11, 12, figs. 41, 53
facetus (Arrenurus) 11, 12, figs. 37-40, 48
falcicornis-group 4, 5, 6, 7
flabellifer (Arrenurus) 29
floridensis (Arrenurus, Micruracarus) 17, 18, figs. 54, 61, 63, 64, 73
harperae (Arrenurus) 7, 8, 9, figs. 27, 28, 30-32
hovus (Arrenurus, Micruracarus) 15, figs. 66, 67, 69, 70, 75
immokaleensis (Arrenurus, Micruracarus) 16, figs. 56, 68, 77
intermedius (Arrenurus, Megaluracarus) 22
kennedyorum (Arrenurus, Truncaturus) 1
kinkaidi (Arrenurus, Megaluracarus) 26
longicaudatus (Arrenurus, Megaluracarus) 25
lyriger (Arrenurus, Micruracarus) 15
magnicaudatus (Arrenurus) 29
major (Arrenurus) 4
manateensis (Arrenurus) 2, 3, figs. 2, 5, 6
manubriator (Arrenurus, Megaluracarus) 27
marionensis (Arrenurus) 4, figs. 9, 10, 12
marshallae (Arrenurus, Megaluracarus) 29
marshallae-group 21
megalurus (Arrenurus, Megaluracarus) 21, 30
melemus (Arrenurus, Megaluracarus) 28, figs. 124-126, 131, 133
membranator (Arrenurus, Megaluracarus) 28
Micruracarus 16
nasus (Arrenurus, Megaluracarus) 26, figs. 115-117
nedymus (Arrenurus, Megaluracarus) 26, figs. 118, 121, 132
neobirgei (Arrenurus, Megaluracarus) 30
neocrenellatus (Arrenurus, Micruracarus) 16, 17, figs. 55, 62, 65, 71, 74
newelli (Arrenurus) 3, figs. 7, 8, 11
odatus (Arrenurus, Megaluracarus) 25, figs. 108, 110, 112-114
omarus (Arrenurus) 13, figs. 42, 45, 52
opiparus (Arrenurus, Megaluracarus) 28, figs. 122, 123, 129
optatus (Arrenurus, Megaluracarus) 27, figs. 119, 120, 127, 128, 130
pandarus (Arrenurus, Megaluracarus) 23, 24, figs. 100, 102, 103, 105, 106
paralleatus (Arrenurus, Megaluracarus) 26
parasuperior (Arrenurus) 13, figs. 43, 44, 60
pilumnus (Arrenurus, Megaluracarus) 24, 25, figs. 101, 104, 107
pistillatus (Arrenurus) 5, 6
platyrotundocuspidator (Arrenurus) 30
pleopetiolatus (Arrenurus) 30
problecornis (Arrenurus, Megaluracarus) 21, figs. 85, 86, 88, 91, 95
prodromocornis (Arrenurus, Megaluracarus) 22, figs. 96, 97, 99
pseudoconicus (Arrenurus, Megaluracarus) 26
pseudocylindratus (Arrenurus, Megaluracarus) 29
pseudosuperior (Arrenurus) 14
pseudotenuicollis (Arrenurus, Megaluracarus) 22, 30
rumulus (Arrenurus, Megaluracarus) 23, 24, figs. 98, 109, 111
scutuliformis (Arrenurus, Megaluracarus) 26
semicircularis (Arrenurus, Megaluracarus) 25
successus (Arrenurus, Megaluracarus) 19, figs. 80, 81, 87
superior (Arrenurus) 14
superior-group 10, 11, 14
tamiamiensis (Arrenurus) 6, figs. 19, 21, 22
texensis (Arrenurus) 8
trifoliatus (Arrenurus) 14, 15
Truncaturus 1
uniprojectus (Arrenurus) 10, 30
veracundus (Arrenurus, Megaluracarus) 18, figs. 76, 78, 79, 83, 84
wallensis (Arrenurus) 13, figs. 46, 47
wardi (Arrenurus, Megaluracarus) 26
wilsoni (Arrenurus) 9, 10, figs. 33-36
zachariae (Arrenurus, Megaluracarus) 28
zapus (Arrenurus) 7, figs. 20, 23, 24
zeugicornis (Arrenurus) 5, 6, figs. 15, 17, 18
ziseri (Arrenurus) 14, figs. 57-59
zorus (Arrenurus, Megaluracarus) 19, 20, figs. 72, 82, 89, 90